
Bilicki
RESEARCH CONCLUDES:
WE ARE DESTROYING EARTH.
COULD YOU KINDLY REPHRASE THAT IN EQUIVOCAL, INACCURATE, VAGUE, SELF-SERVING AND ROUNDABOUT TERMS THAT WE CAN ALL UNDERSTAND?
GOVERNMENT

Biodiversität als sozio-ökonomische Herausforderung· (Un)versöhnlichkeit von Wissenschaft und Politik?“

Didier Babin

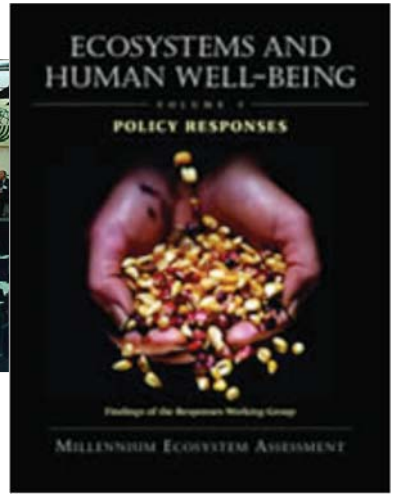
CIRAD

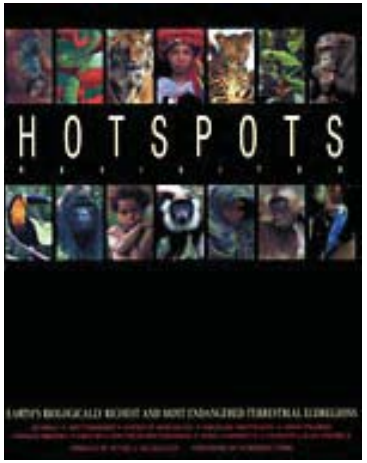
FRB
FONDATION POUR LA RECHERCHE SUR LA BIODIVERSITÉ

Biodiversity for Humankind

EARTH SUMMIT 92

UNCED och GLOBAL FORUM
Rio de Janeiro 1-14 juni 1992





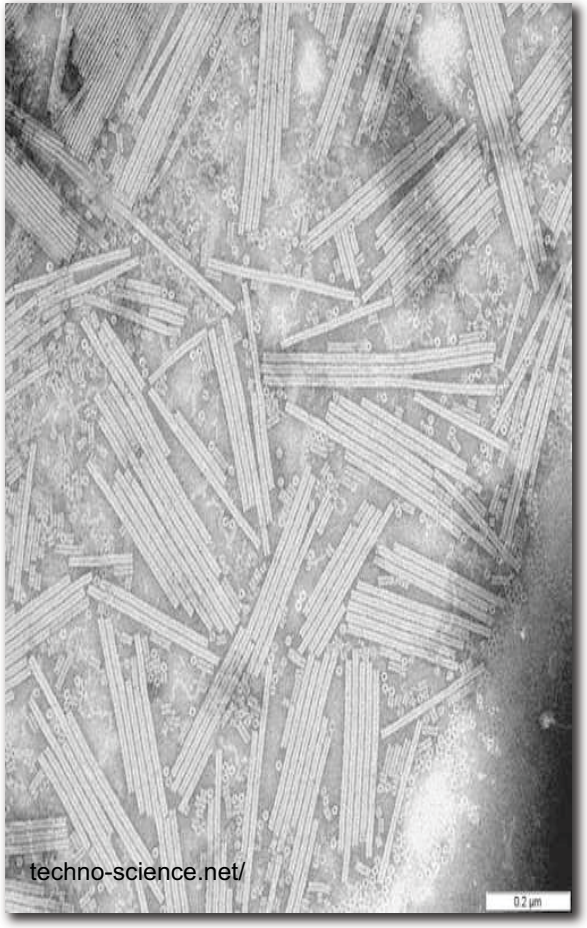
BIODIVERSITY

???

Representation

One Earth, how many species ?

1 800 000 or 100 000 000 (10^8) or
10 000 000 000 000 000 000 000 000 000 000 (10^{31})

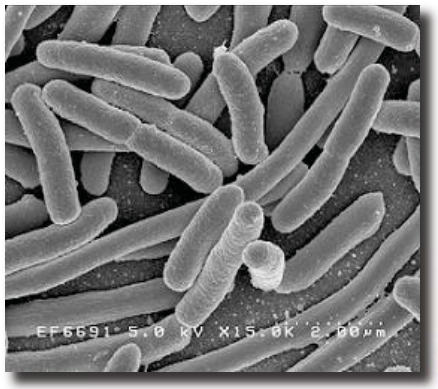


About quantity

- 4 x 10^{24} (with *H. sapiens)*
- 1 X 10^{28} (freshwater habitats)
- 2 x 10^{29} (soils)
- 3 x 10^{30} (sea)

…

TOTAL ≈ 5 x 10^{30}

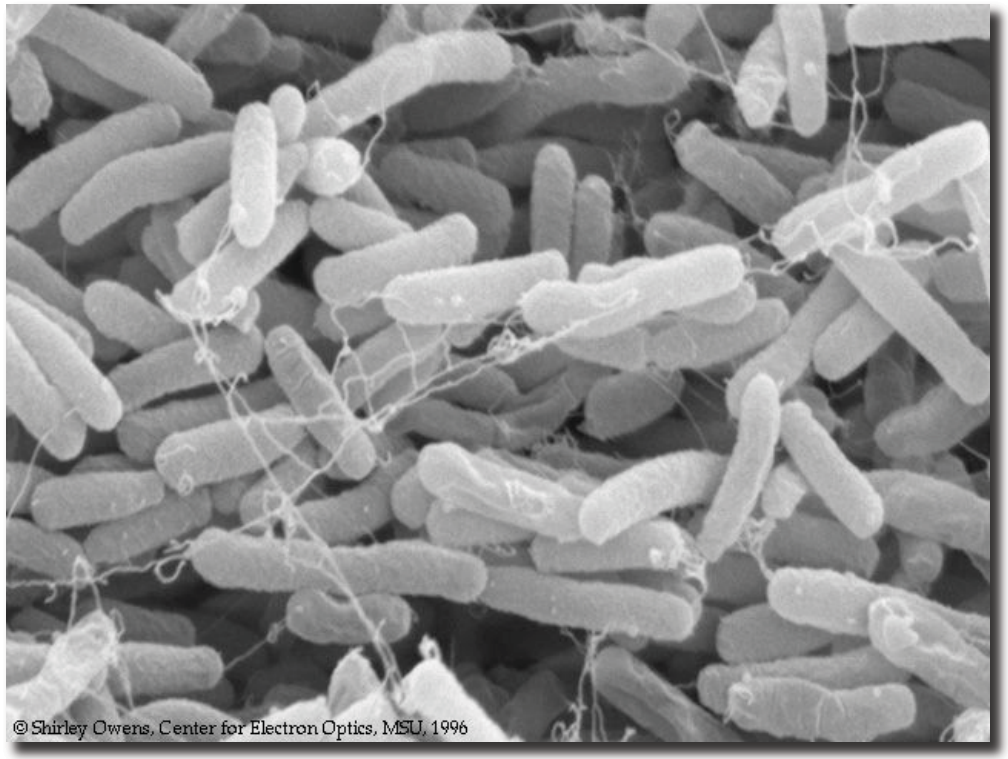


Quantity of Bacteria

Biomass

Biosphere = « microbes» !

Symbiosis & Interactions

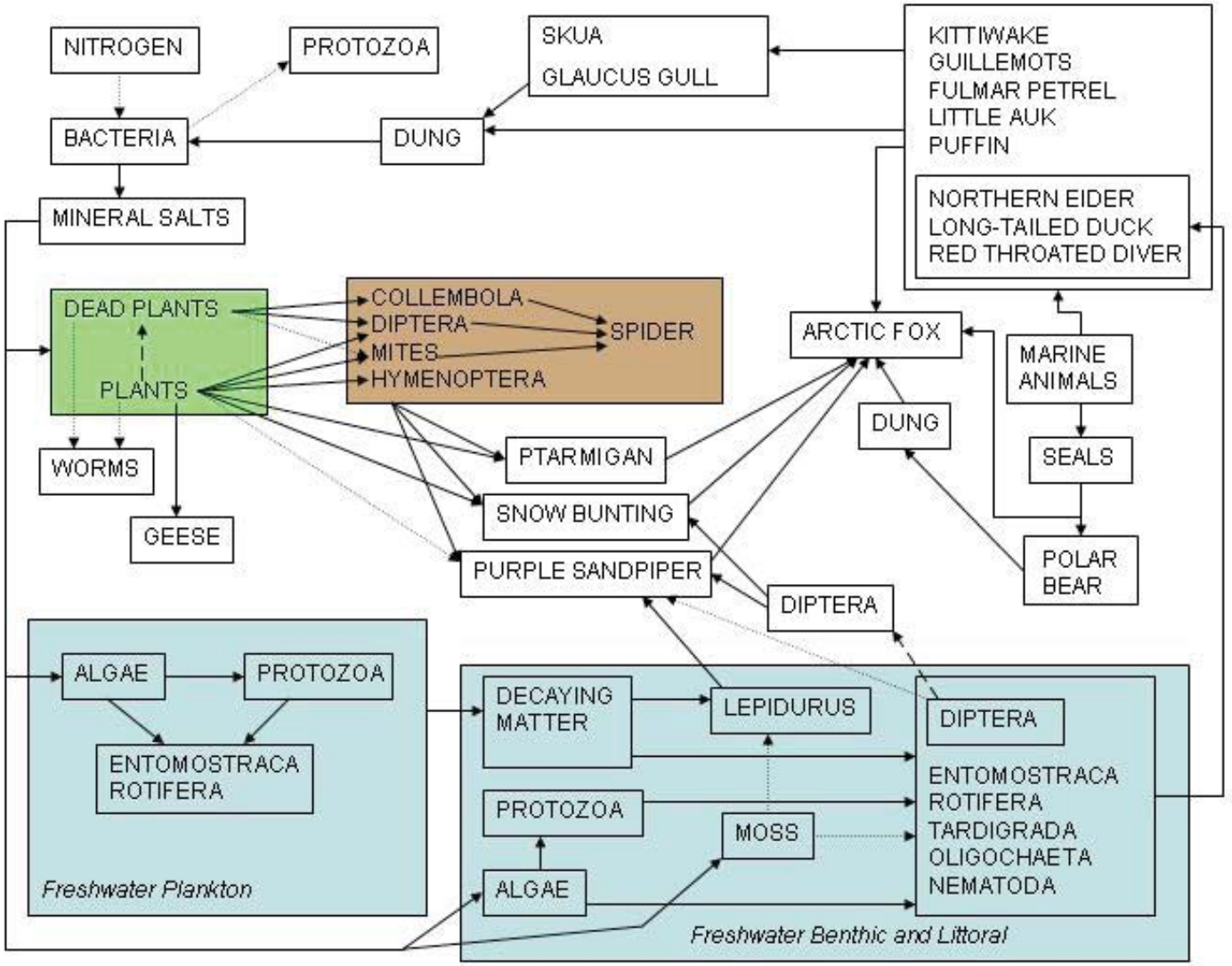


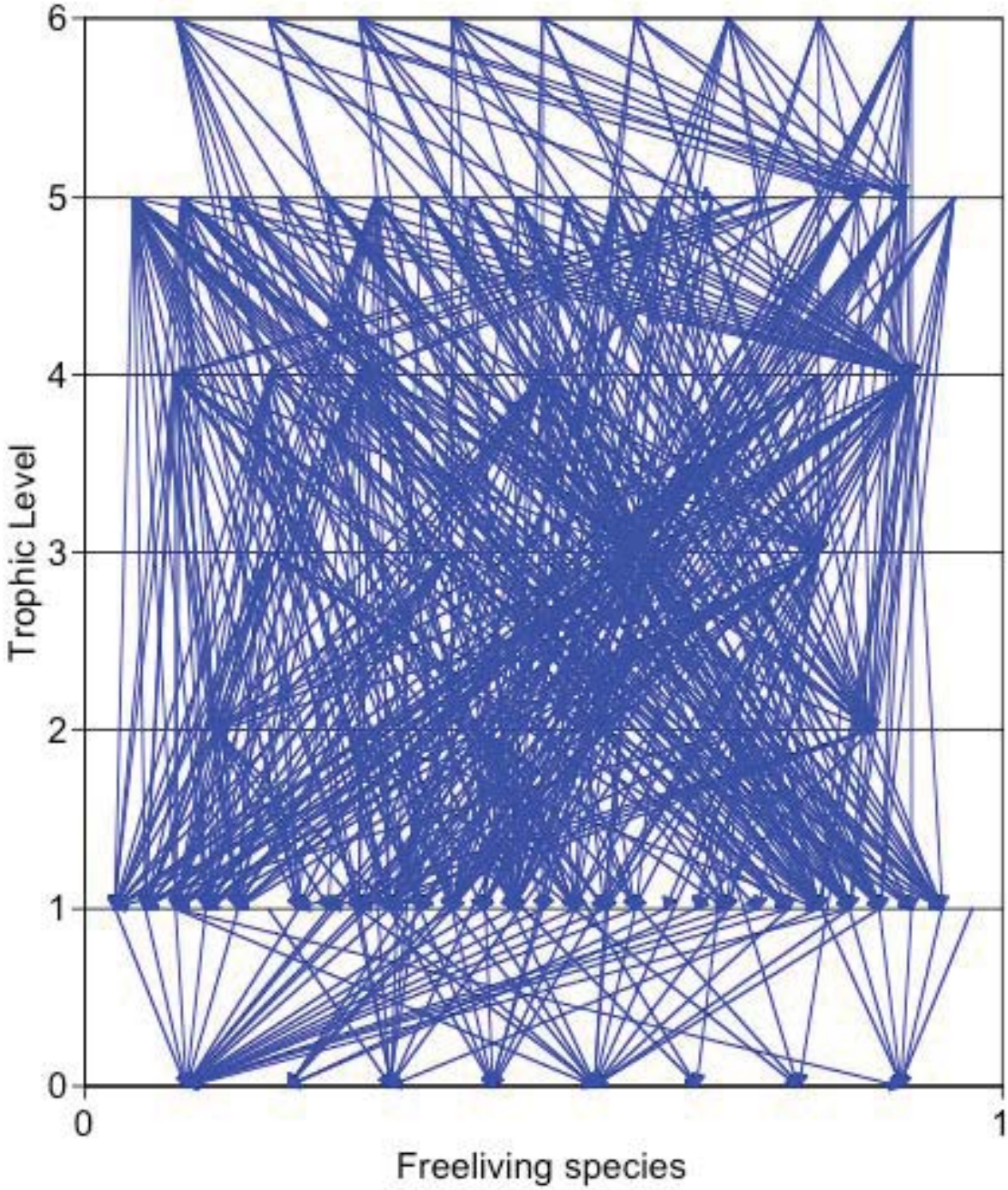
≈10^{14} ¢ *vs* ≈10^{15} bacteria

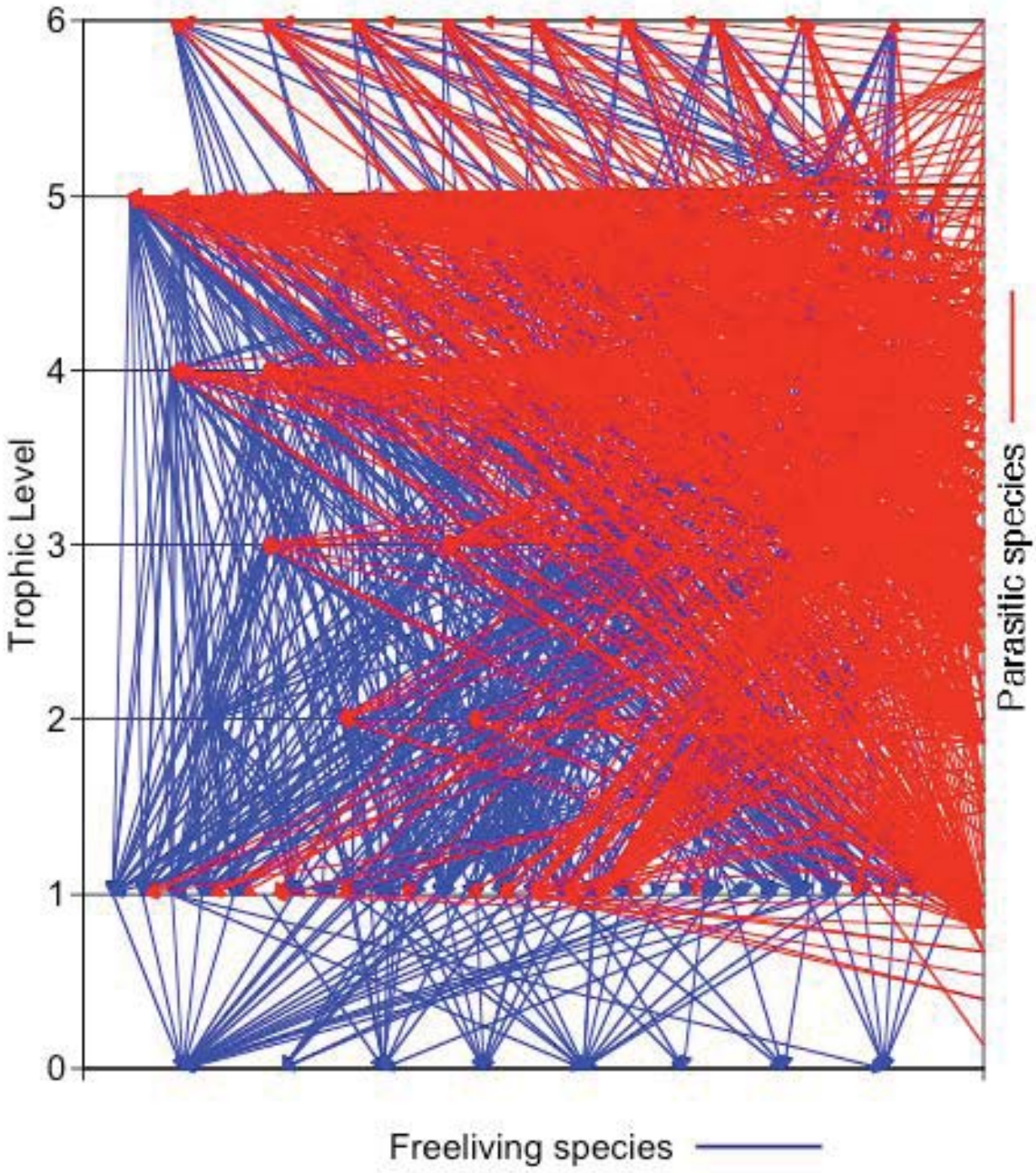
2 kg !

≈ 400 species

Food Web

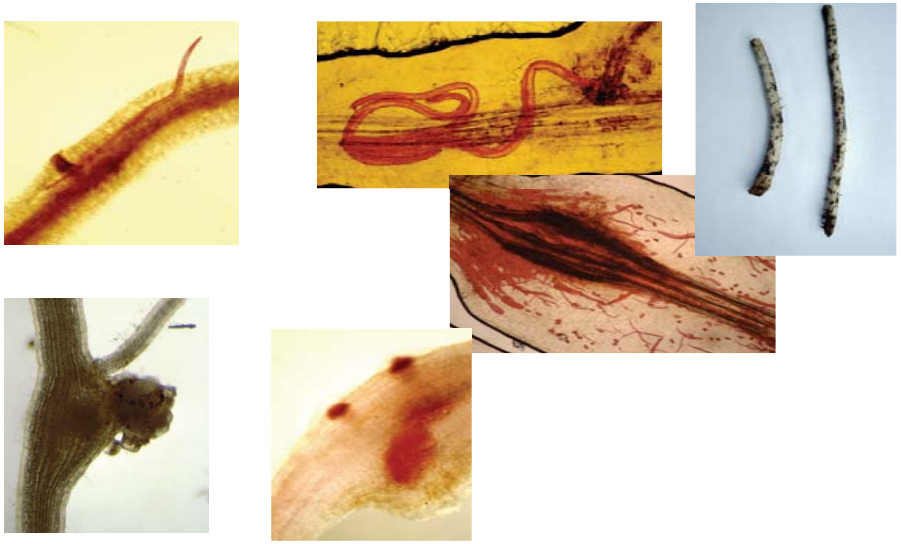

NITROGEN
PROTOZOA
SKUA
GLAUCUS GULL
KITTIWAKE
GUILLEMOTS
FULMAR PETREL
LITTLE AUK
PUFFIN
BACTERIA
DUNG
NORTHERN EIDER
LONG-TAILED DUCK
RED THROATED DIVER
MINERAL SALTS
DEAD PLANTS
PLANTS
COLLEMBOLA
DIPTERA
MITES
HYMENOPTERA
SPIDER
ARCTIC FOX
MARINE ANIMALS
DUNG
SEALS
WORMS
PTARMIGAN
SNOW BUNTING
GEESE
PURPLE SANDPIPER
POLAR BEAR
DIPTERA
ALGAE
PROTOZOA
ENTOMOSTRACA
ROTIFERA
Freshwater Plankton
DECAYING MATTER
LEPIDURUS
DIPTERA
ENTOMOSTRACA
ROTIFERA
TARDIGRADA
OLIGOCHAETA
NEMATODA
PROTOZOA
MOSS
ALGAE
Freshwater Benthic and Littoral


6
5
4
3
2
1
0
Trophic Level
0
1
Freeliving species

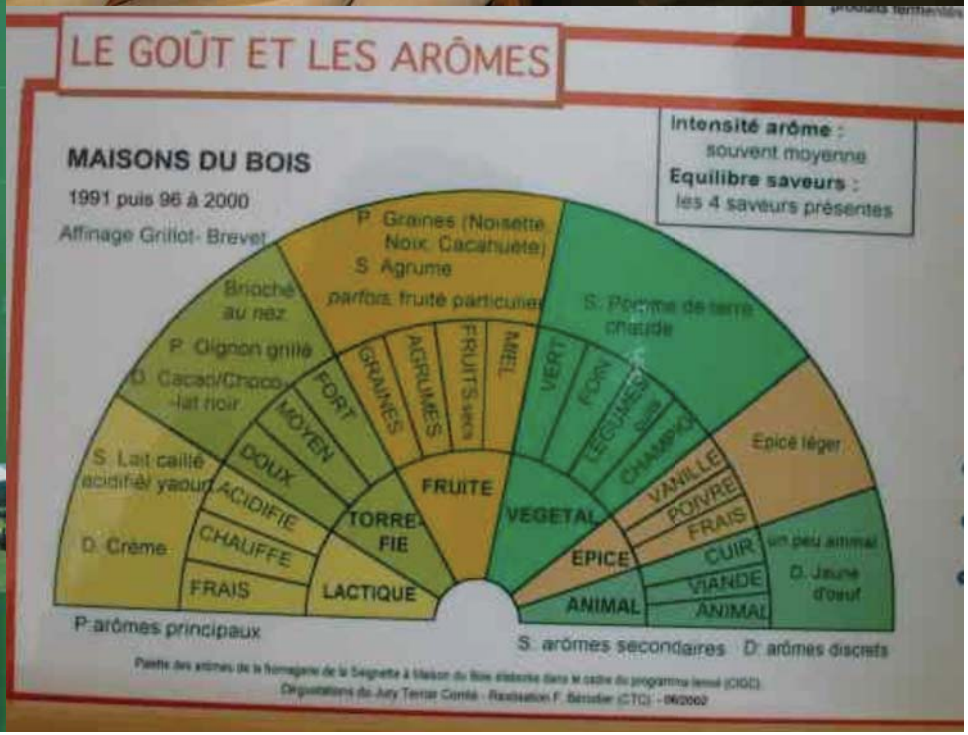

6
5
4
3
2
1
0
Trophic Level
Parasitic species
Freeliving species

« French » biodiversity

Life Web




COMTÉ
Fleurs des terroirs
dans l'AOC Comté
www.comte.com


LE GOÛT ET LES ARÔMES
MAISONS DU BOIS
1991 puis 96 à 2000
Affinage Grillot- Brevet
Intensité arôme :
souvent moyenne
Equilibre saveurs :
les 4 saveurs présentes
P Graines (Noisette Noix Cacahuète)
S Agrume
parfois fruité particulier
Brioché au nez
P Oignon grillé
D Cacao/Chocolat noir
S Lait caillé acidifié yaourt
D Crème
FRAIS
CHAUFFE
ACIDIFIE
DOUX
MOYEN
FORT
GRAINES
AGRUMES
FRUITS secs
MIEL
TORREFIE
LACTIQUE
FRUITE
VERT
FOIN
LEGUMES SECS
CHAMPIGN
VEGETAL
S: Pomme de terre cruede
Epice léger
VANILLE
POIVRE
FRAIS
EPICE
CUIR
VIANDE
ANIMAL
ANIMAL
un peu animal
D Jaune d'oeuf
P:arômes principaux
S: arômes secondaires
D: arômes discrets

Ecosystem Services

Provisioning

G or

•Regulating

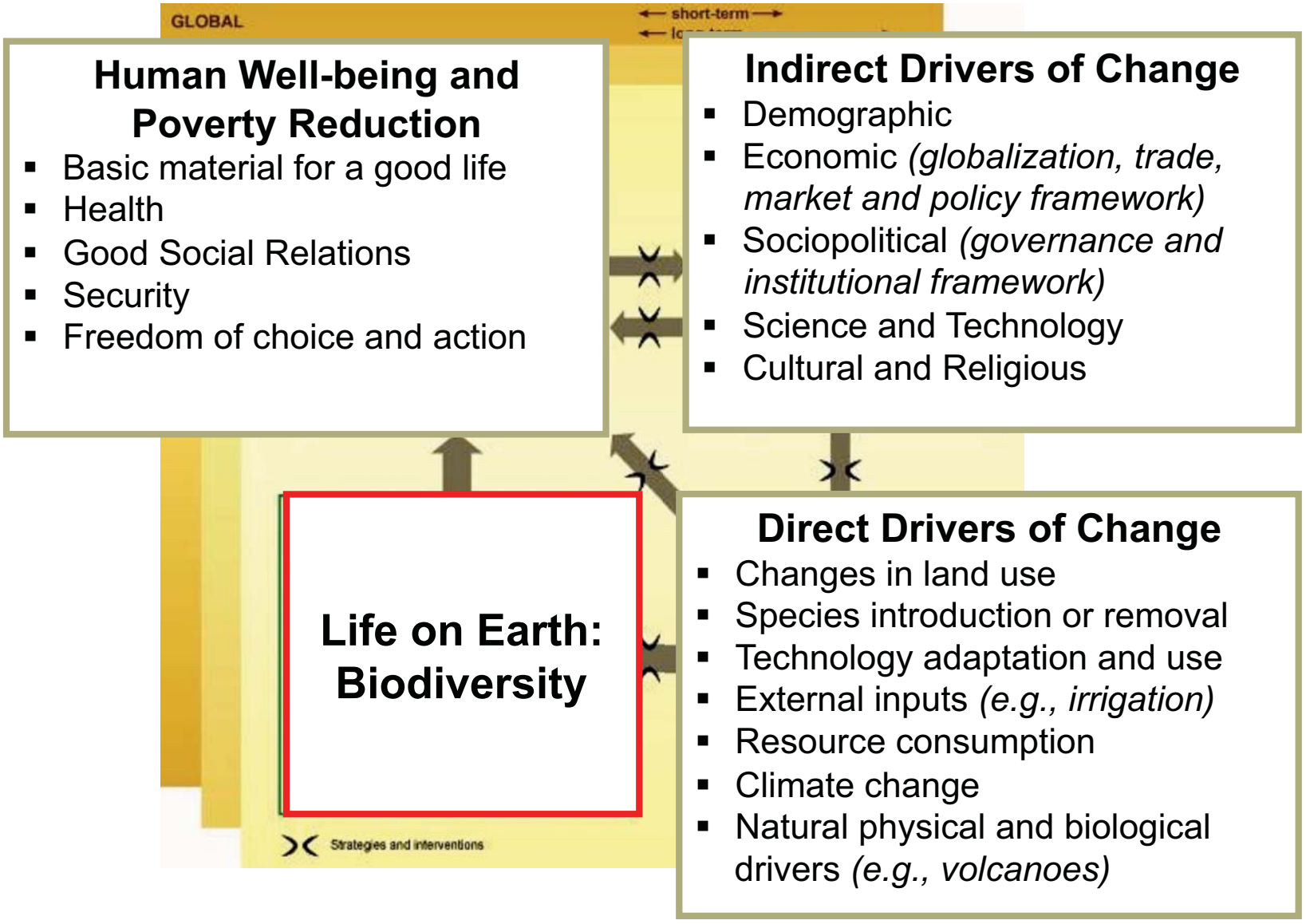
•Be
reg

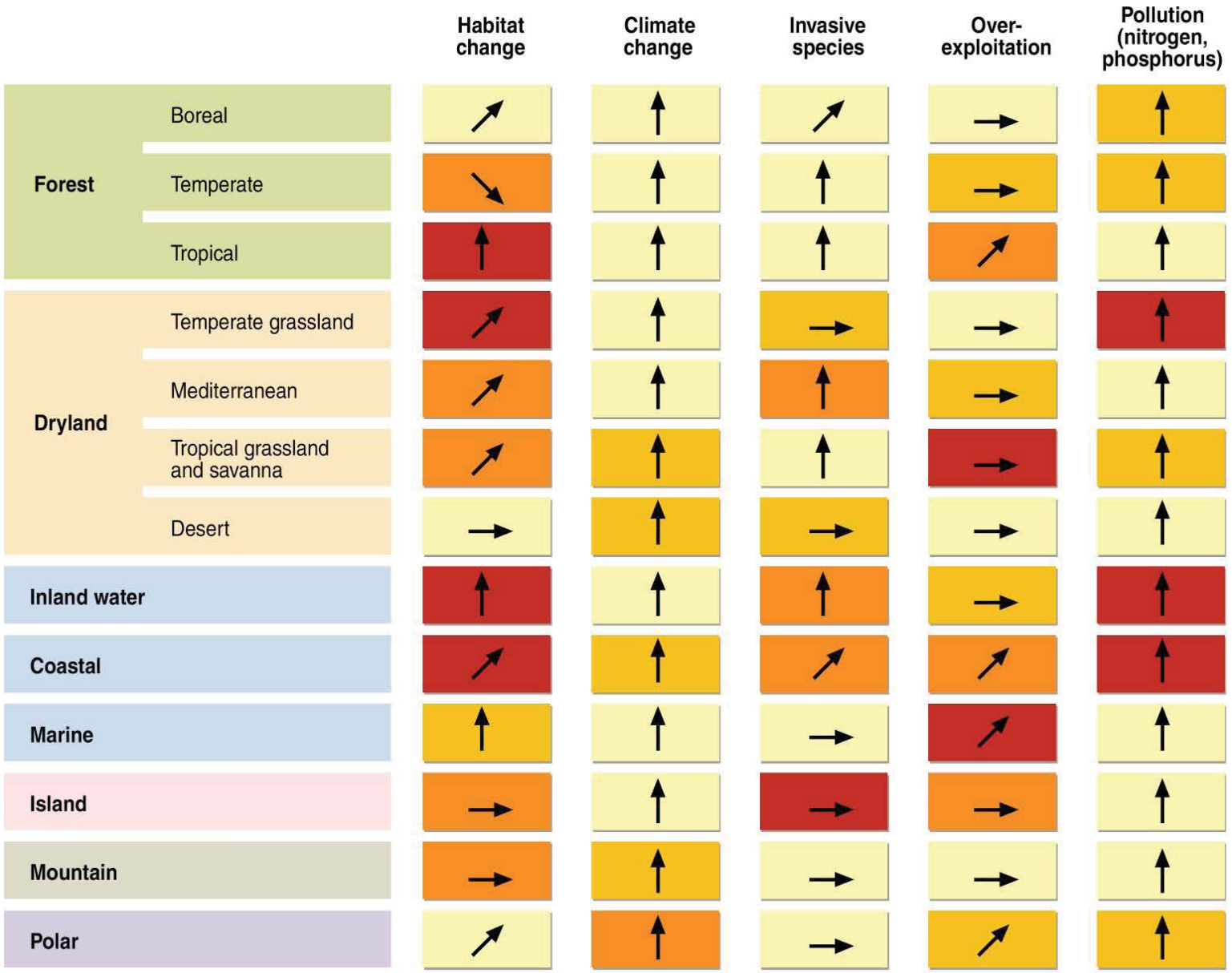
Cultural

N
b
e

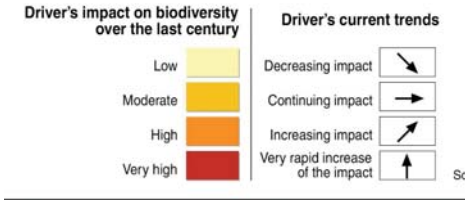
Photo credits (left to right, top to bottom): Purdue University, WomenAid.org, LSUP, NASA, unknown, CEH Wallingford, unknown, W. Reid, Staffan Widstrand

MA Conceptual Framework



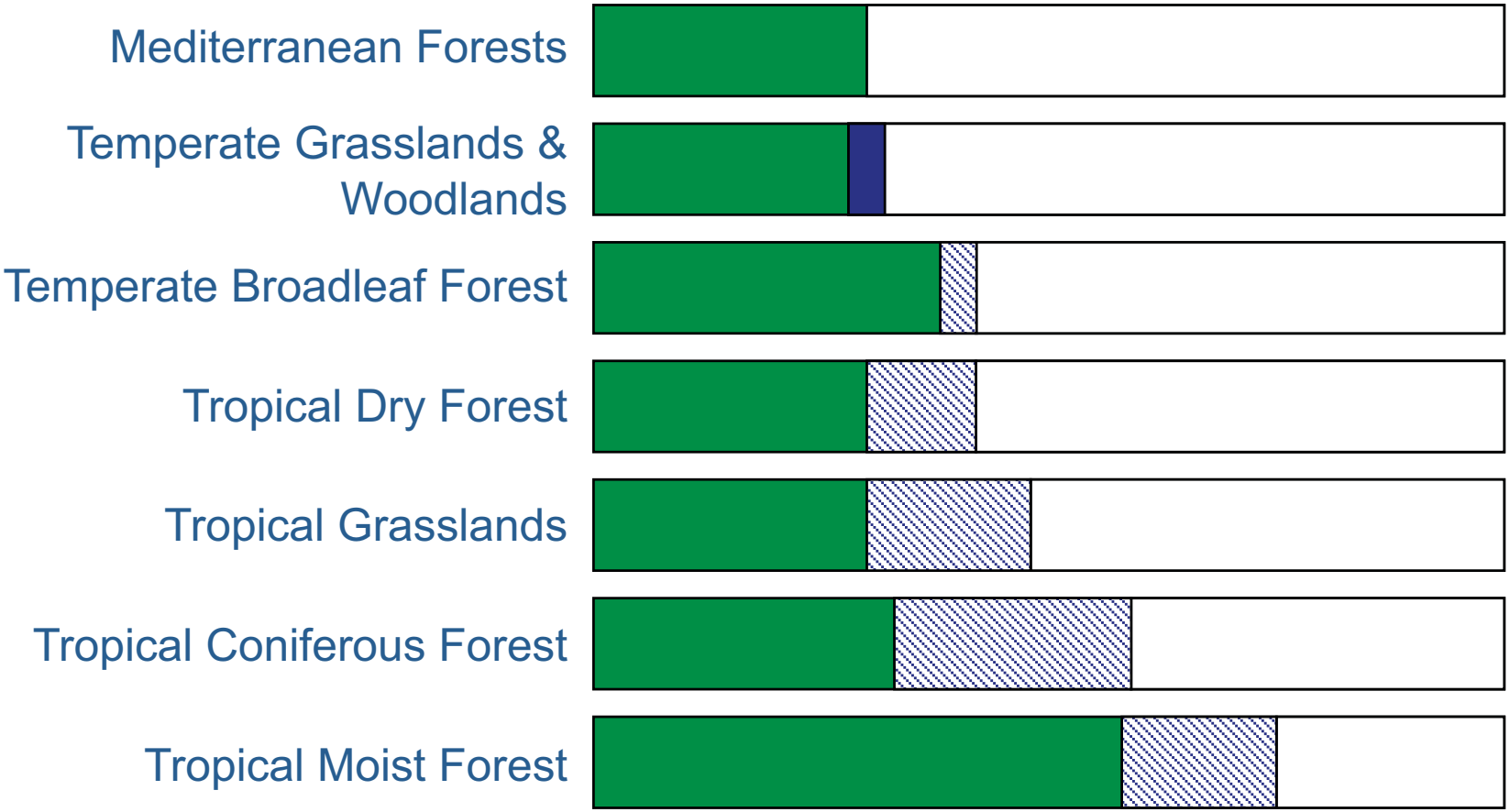


Trends in Drivers



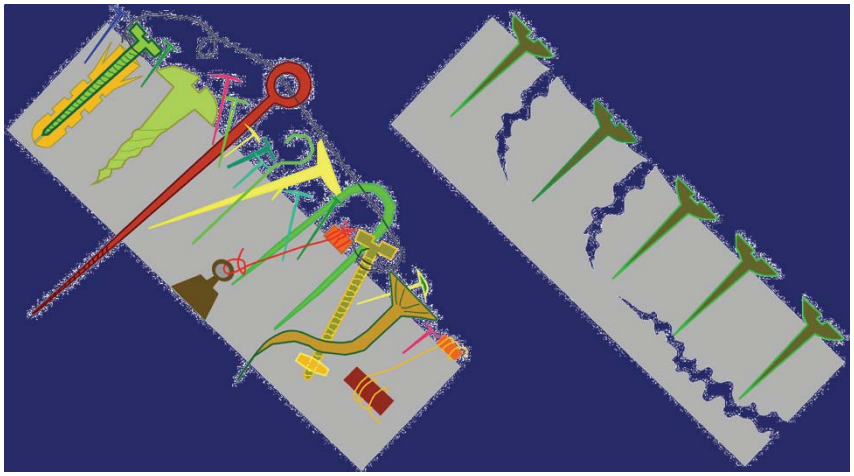
Source: Millennium Ecosystem Assessment

Habitat Loss to 2050 under MA Scenarios



Source: Millennium Ecosystem Assessment

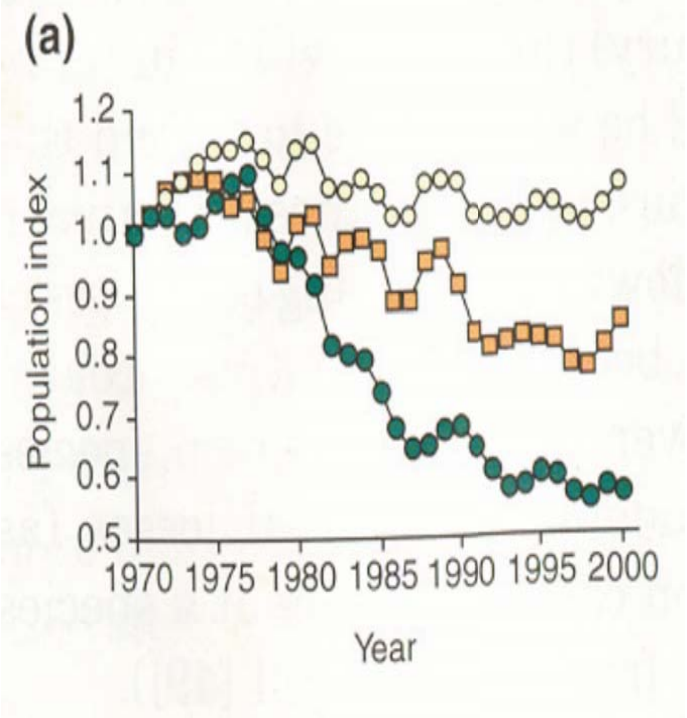
Percent of habitat (biome) remaining



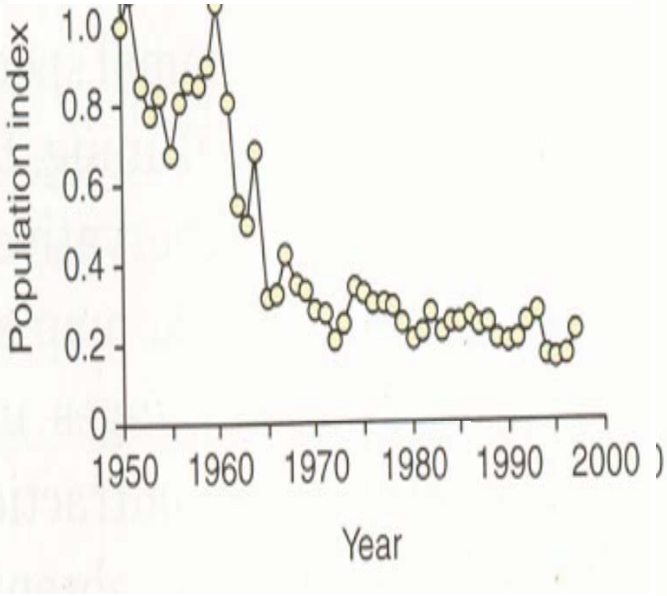
Burton Historical Collection, Detroit Public Library

Decline of Animal Populations

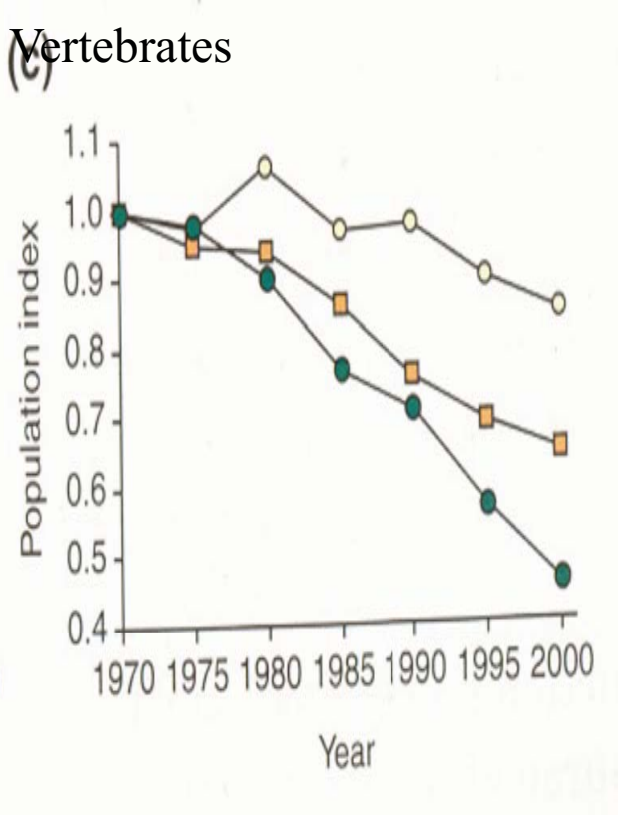
Birds in UK



Amphibinns (World)



Vertebrates



All species

Forest species

Open field species

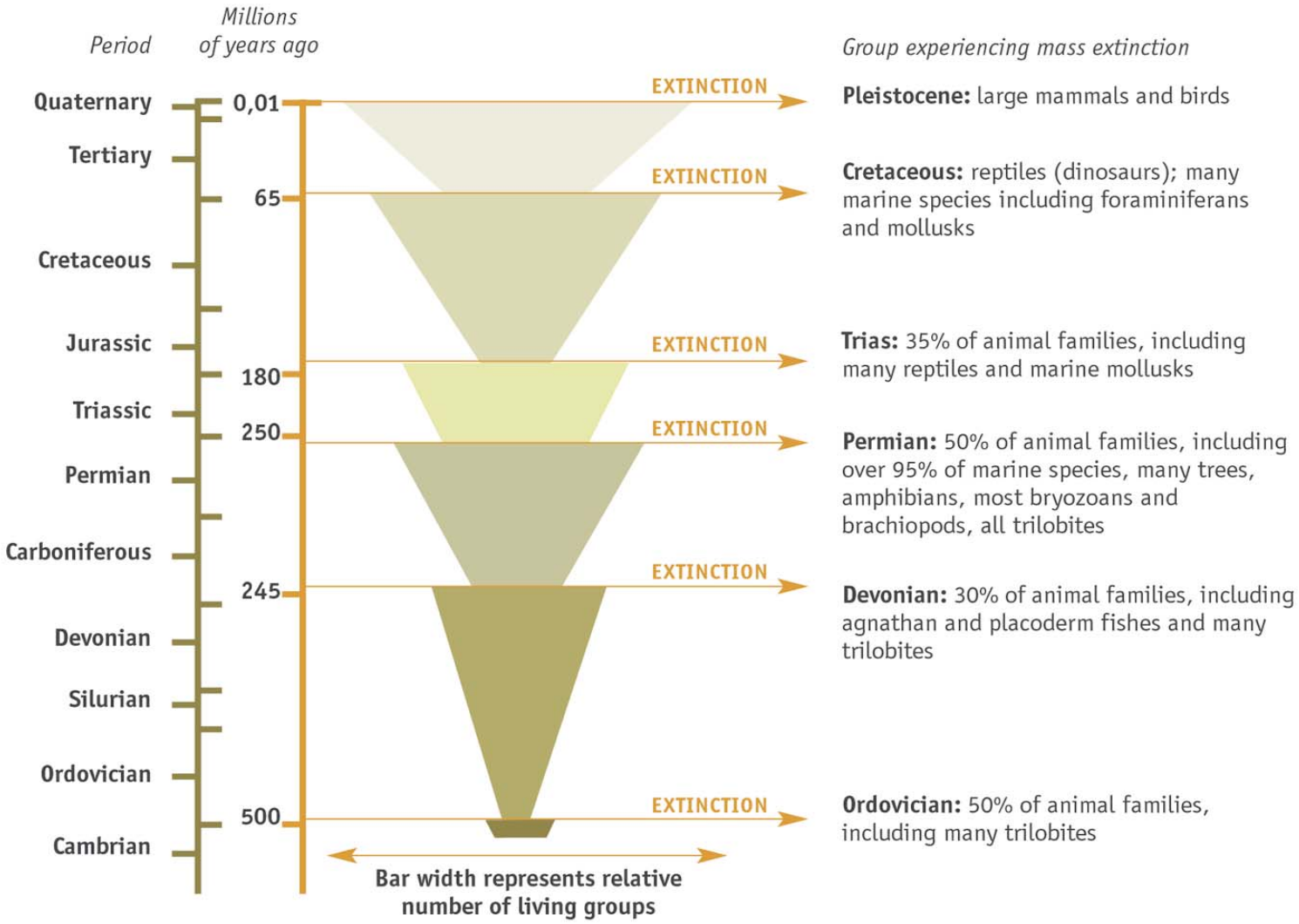
Balmford *et al*. 2003
Trends Ecol. Evol.

Forest Habitats

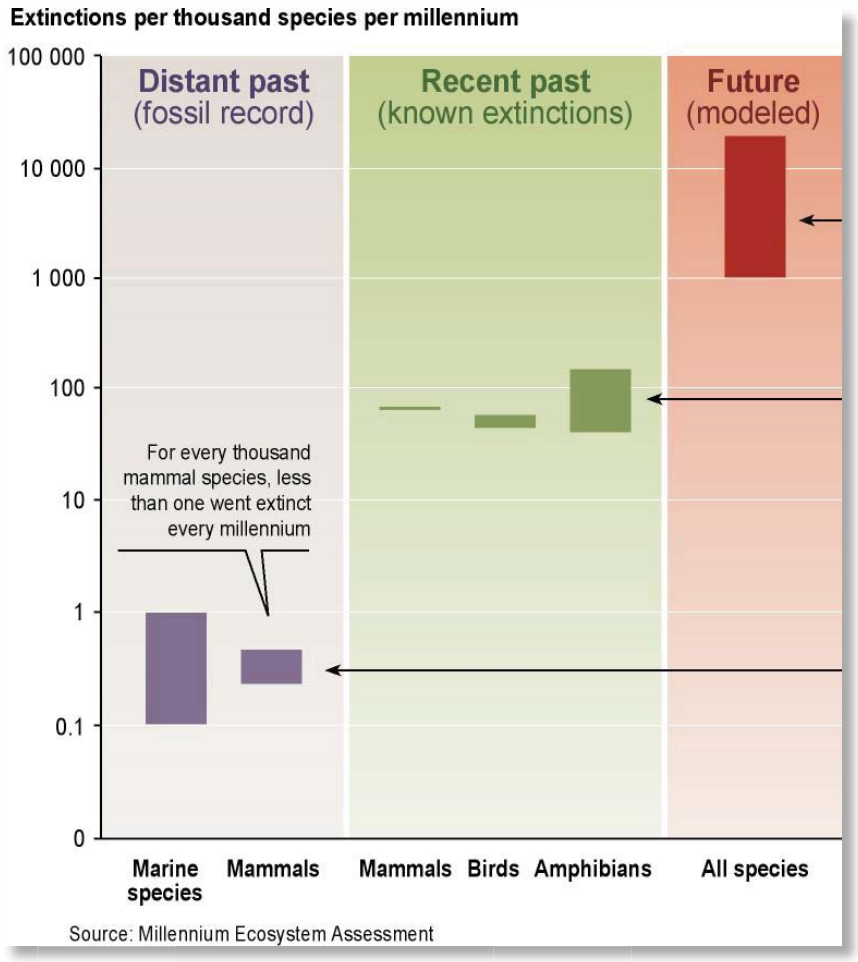
Marine Habitats

Freshwater Habitats

The 5 main extinction crisis ?



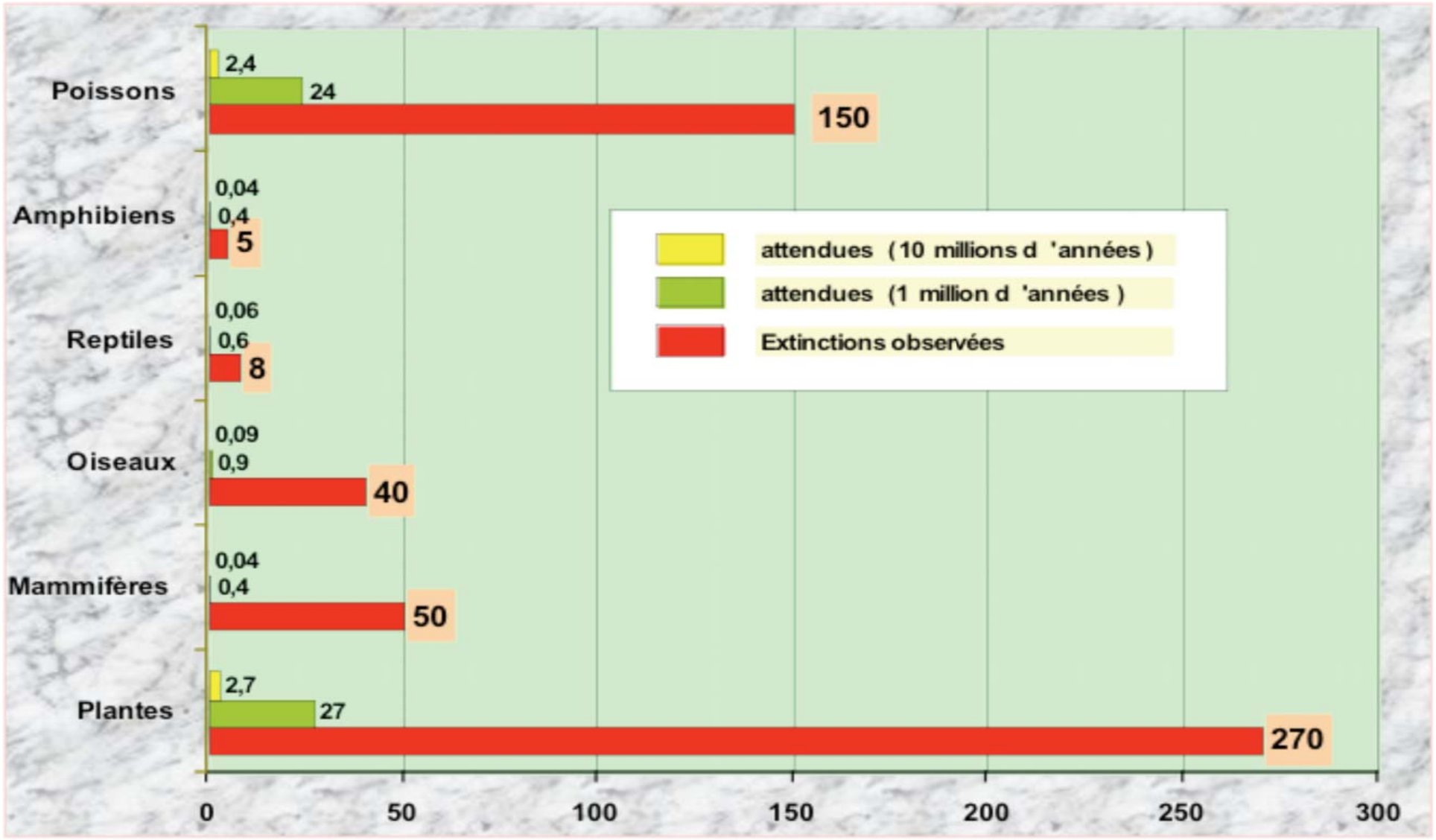
A question of speed



10 — 10^2 — 10^4 — 10^6 → Time (years))

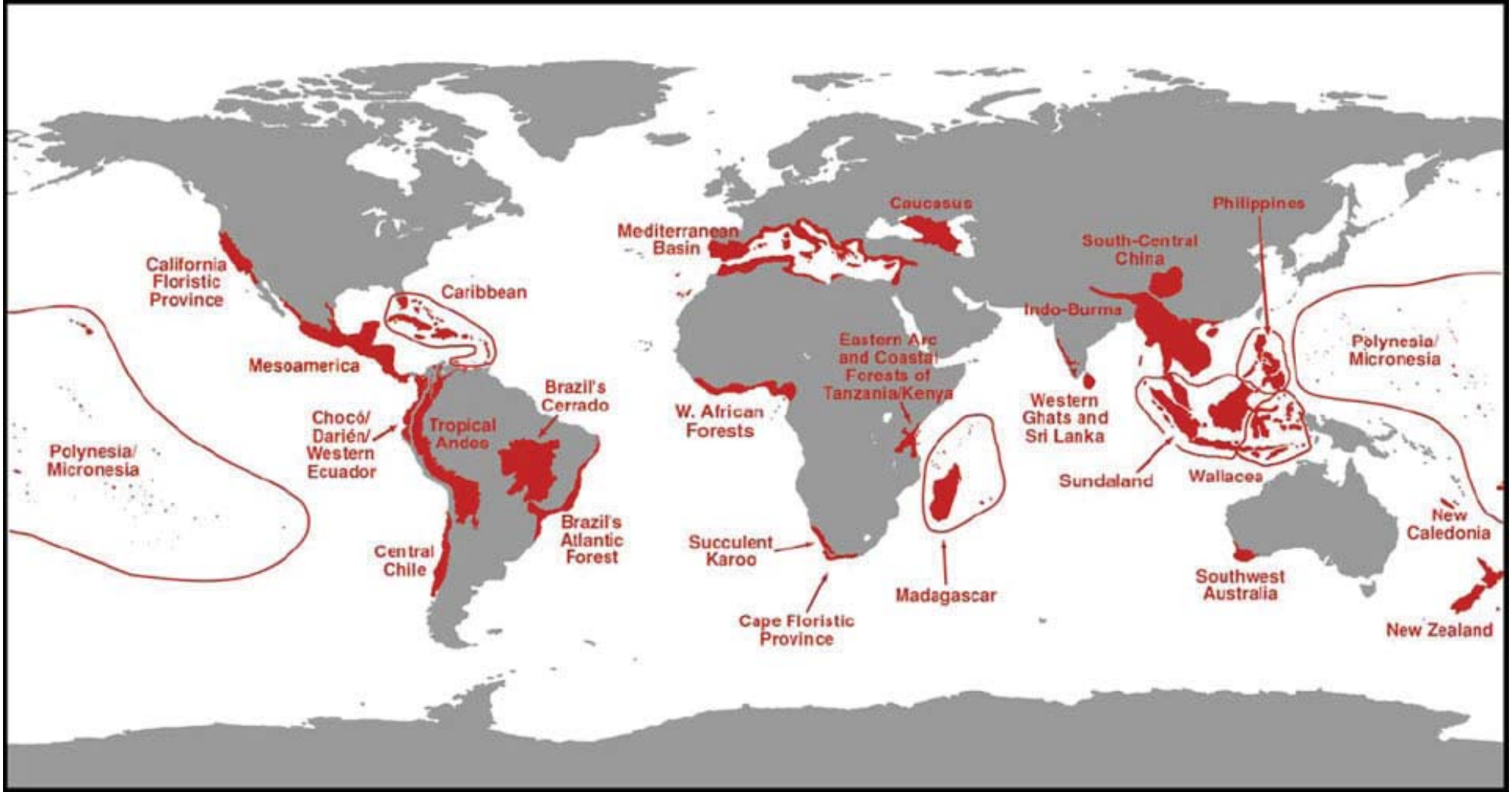
extinction — speciation — life

Towards the 6th Crisis !



"HotSpots" - High diversity, many endemics, threatened 25 areas - 1.4% of land

- 44% of vascular plant species
- 35% of birds, mammals, herps, amphibians

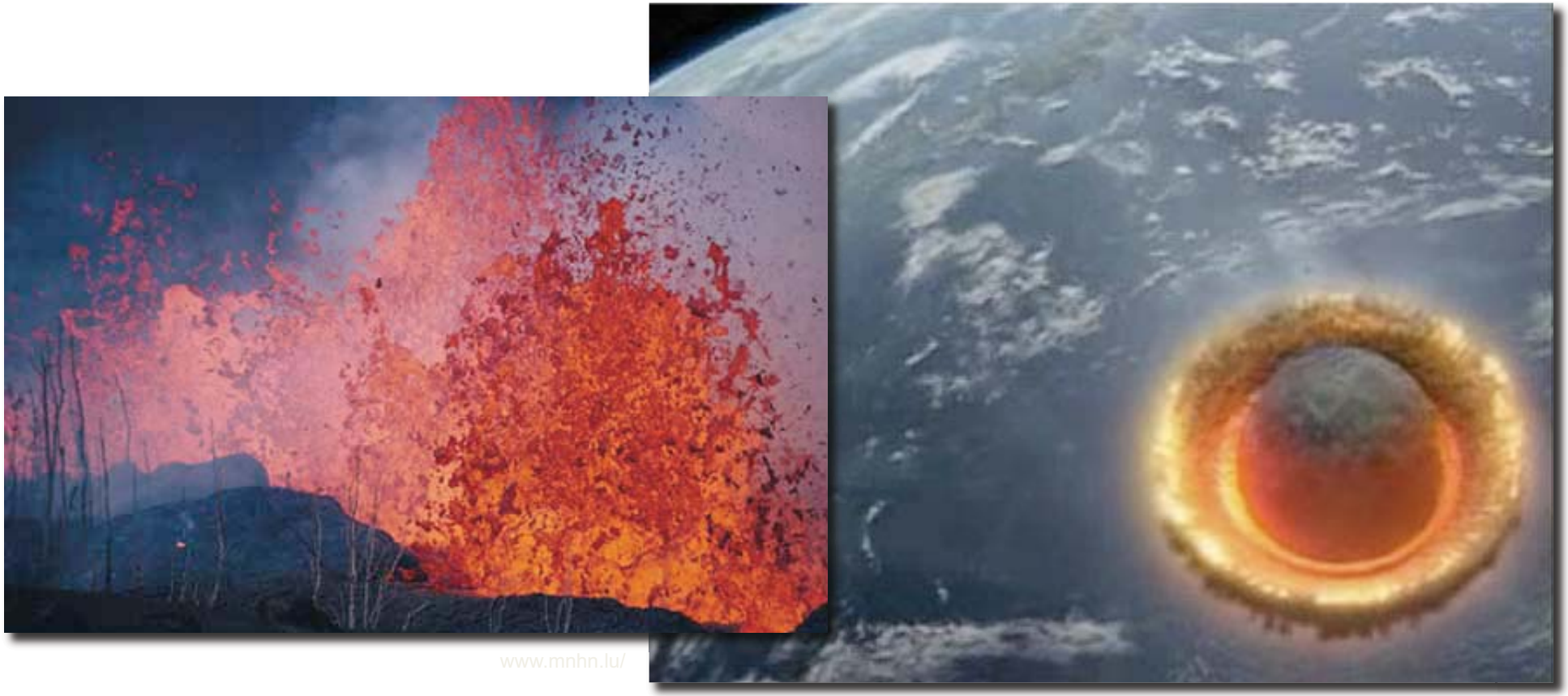


Myers et al., 2000

French mega-diversity throughout the world*

*From "Biodiversité et conservation dans les collectivités françaises d'outre-mer", Comité français pour l'UICN, 2003.

The 5 main extinction crisis ?



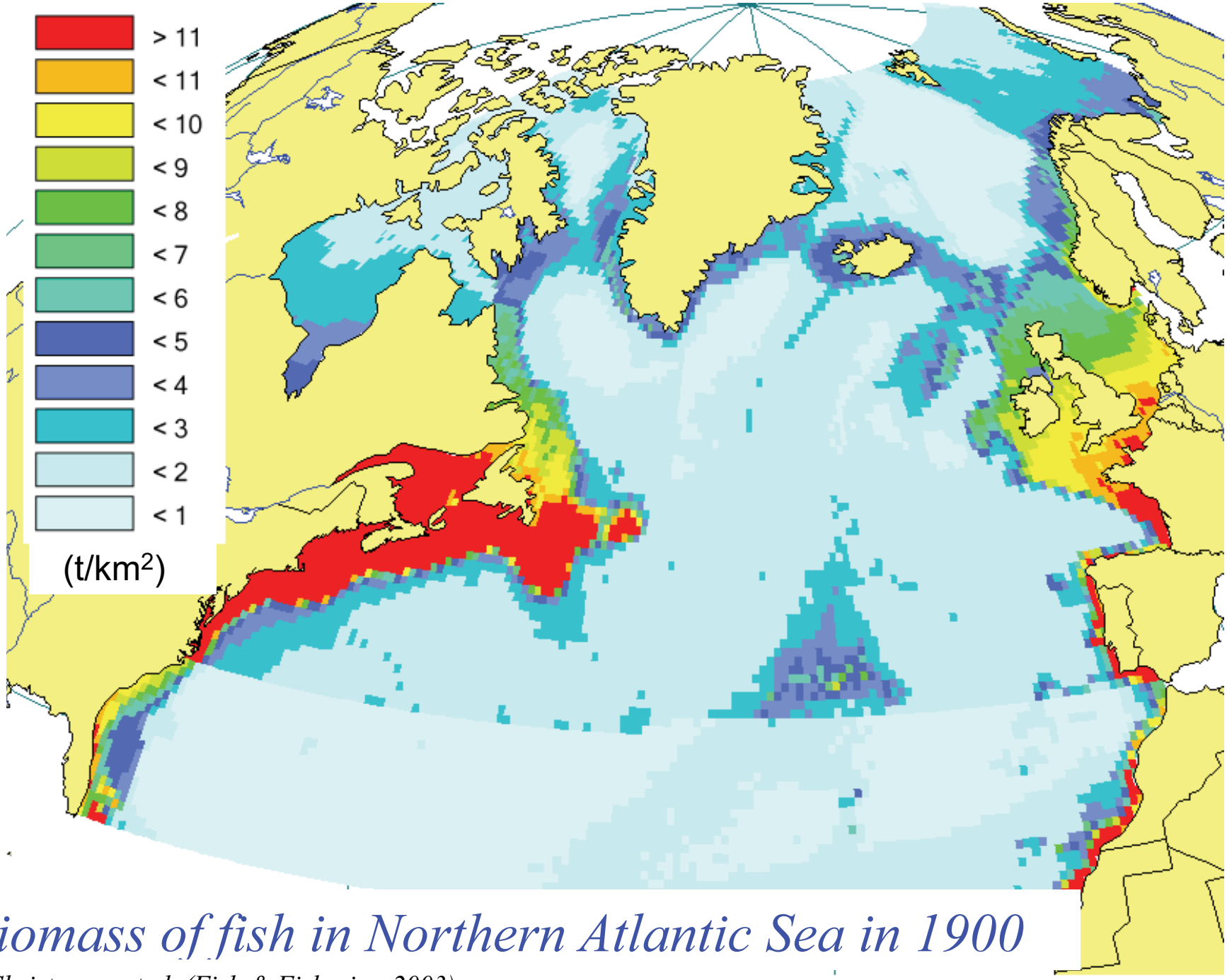
www.mnhn.lu/

www.cherrycoloured.com/

The main causes

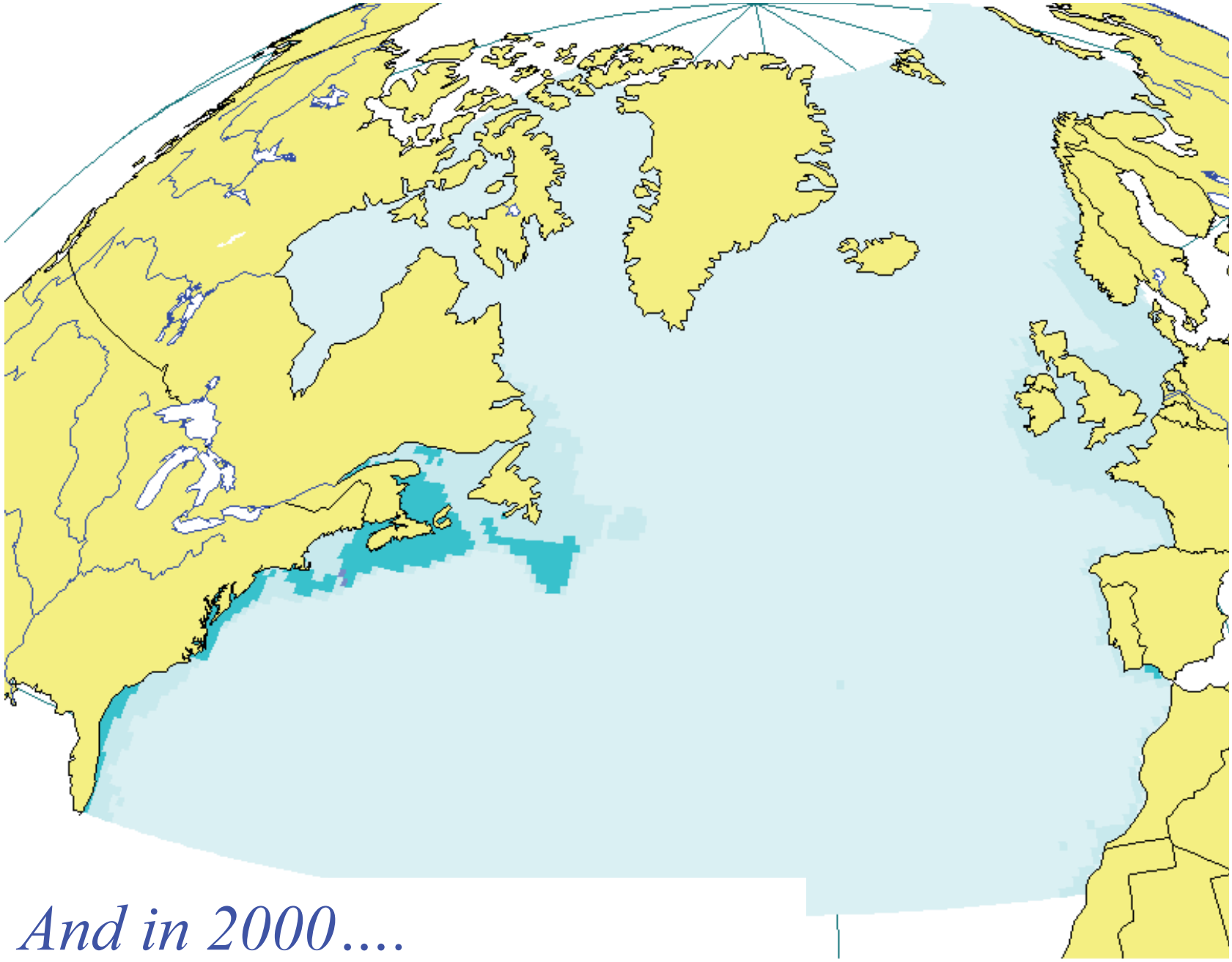
Towards the 6th Crisis !

The main cause : our species !



Biomass of fish in Northern Atlantic Sea in 1900

Christensen et al. (Fish & Fisheries, 2003)

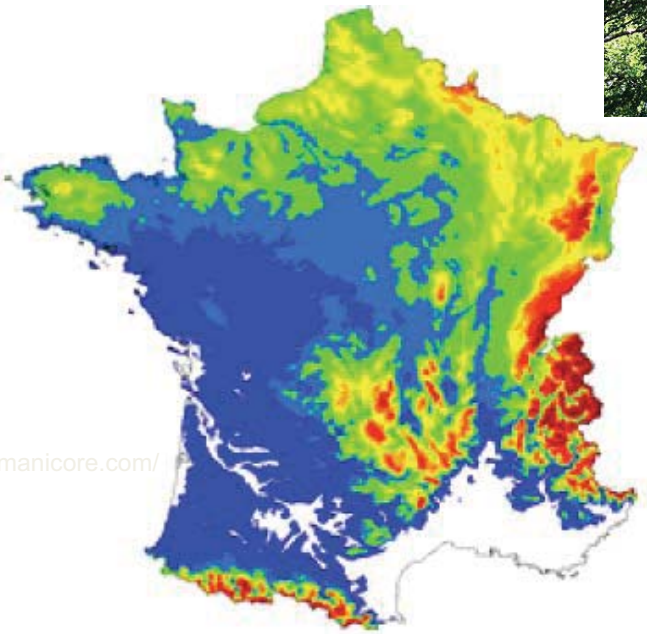


And in 2000….

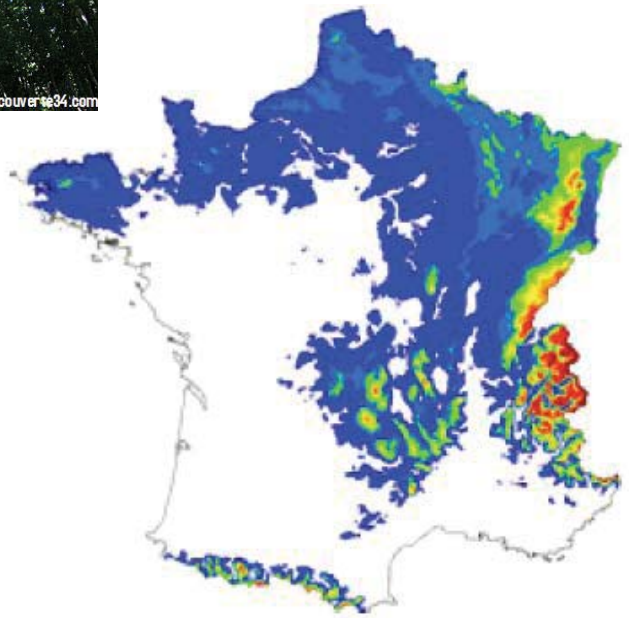
Christensen *et al.* (*Fish & Fisheries,* 2003).

Region	Number of native species	Number of non-native species	Number of non-native species
Europe	**11,000**	**1,568**	**12.5%**
New England	**1,995**	**877**	**30.5%**
New Zealand	**1,790**	**1,570**	**46.7%**
Hawaii	**956**	**861**	**47.4%**
Bermuda	**165**	**303**	**64.7%**

Climate change (beech)



In 2000.



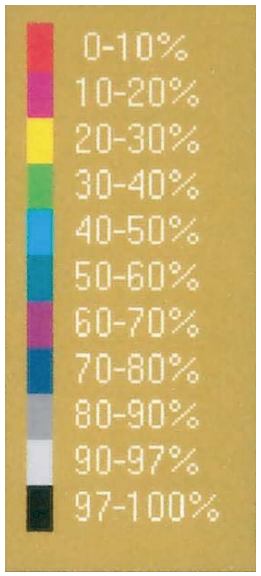
In 2100 (scenario)

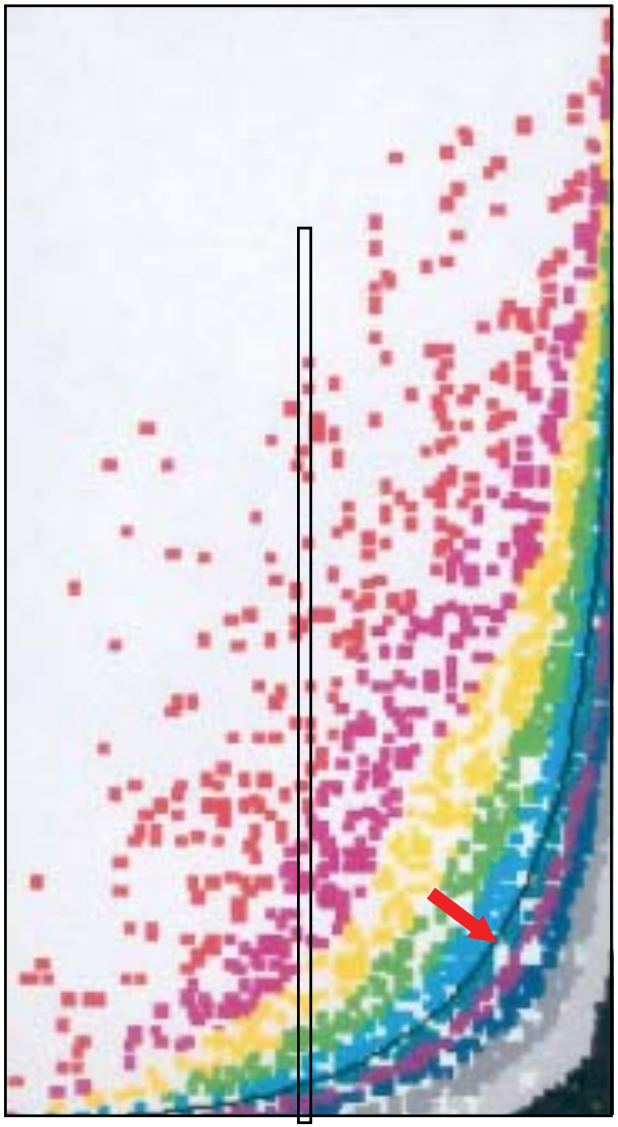
Not very likely

Virtually certain

Pathogenes diversity and climate change

Guégan 12002

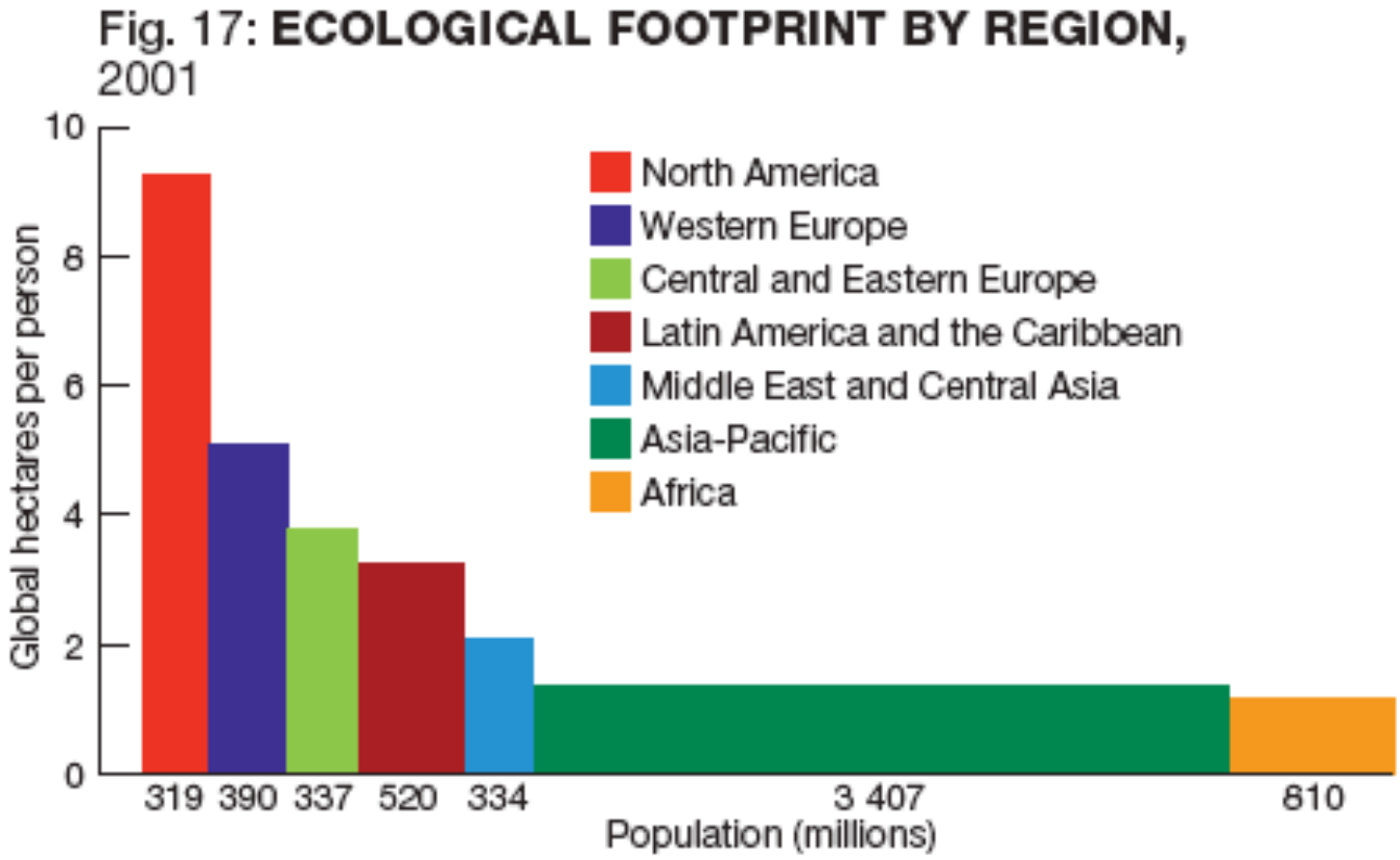




more that 300 times more pathogenes
In tropical areas

335 species

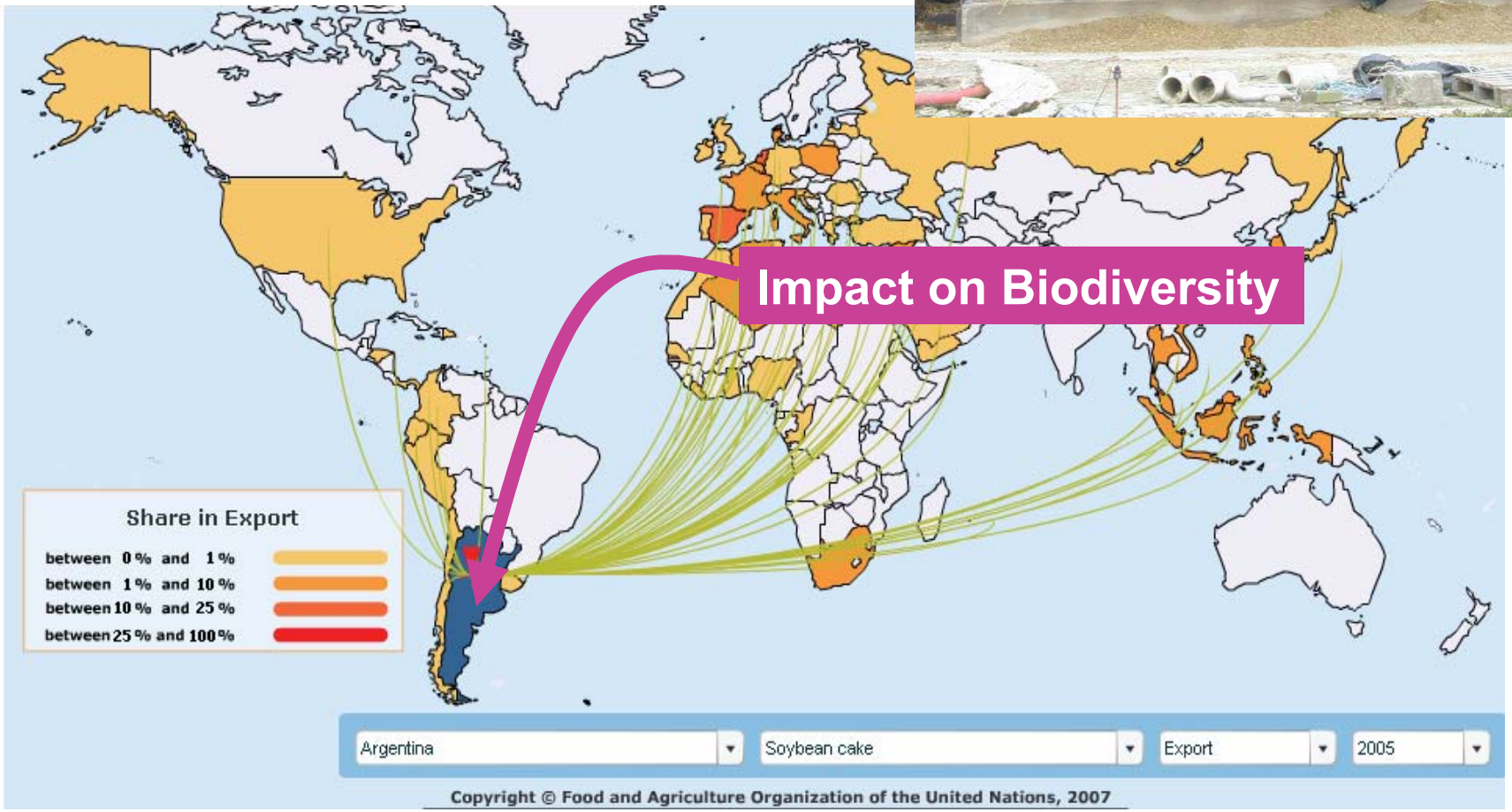
Footprint and Wealth



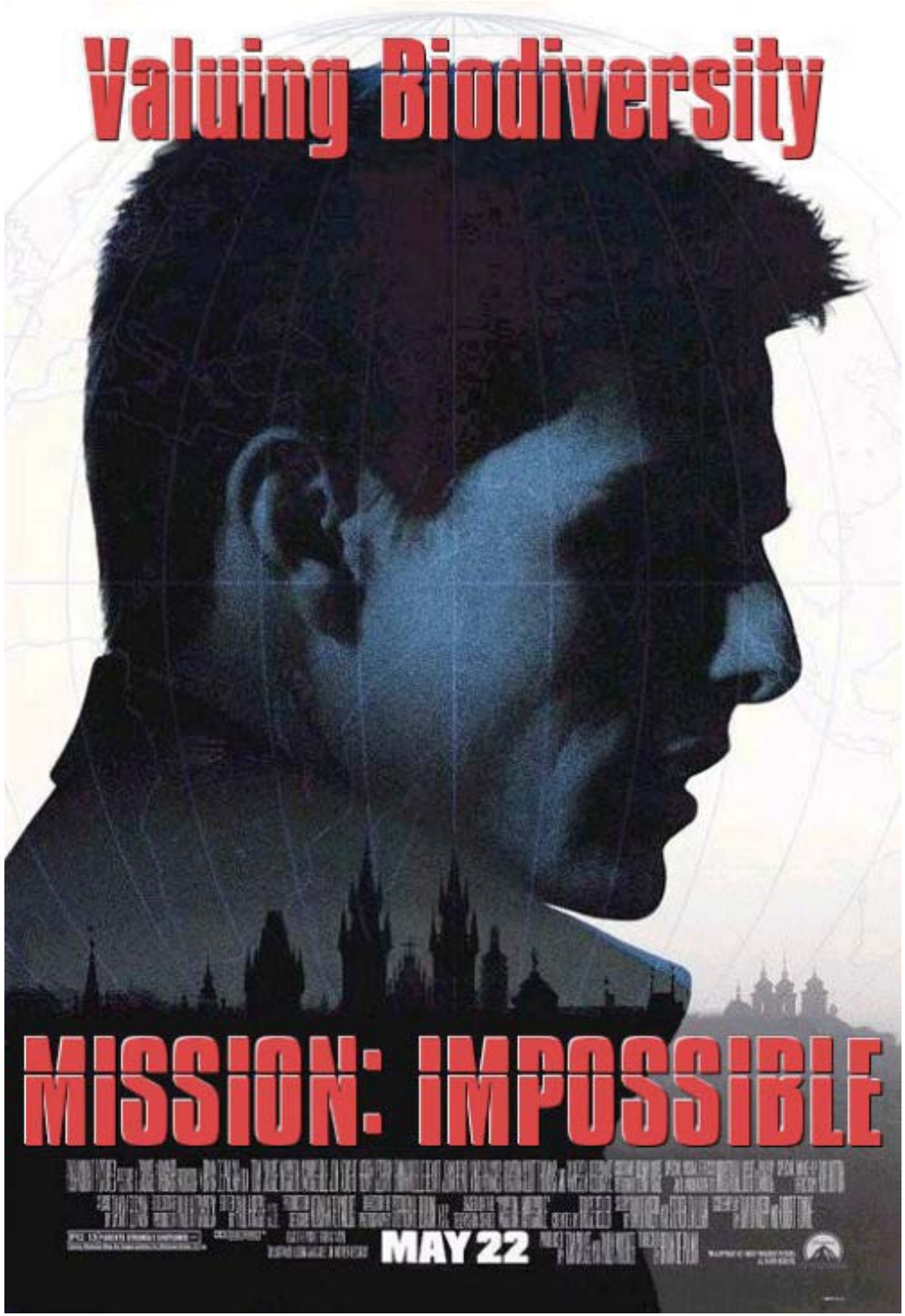
Source : WWF

Biodiversity and Trade

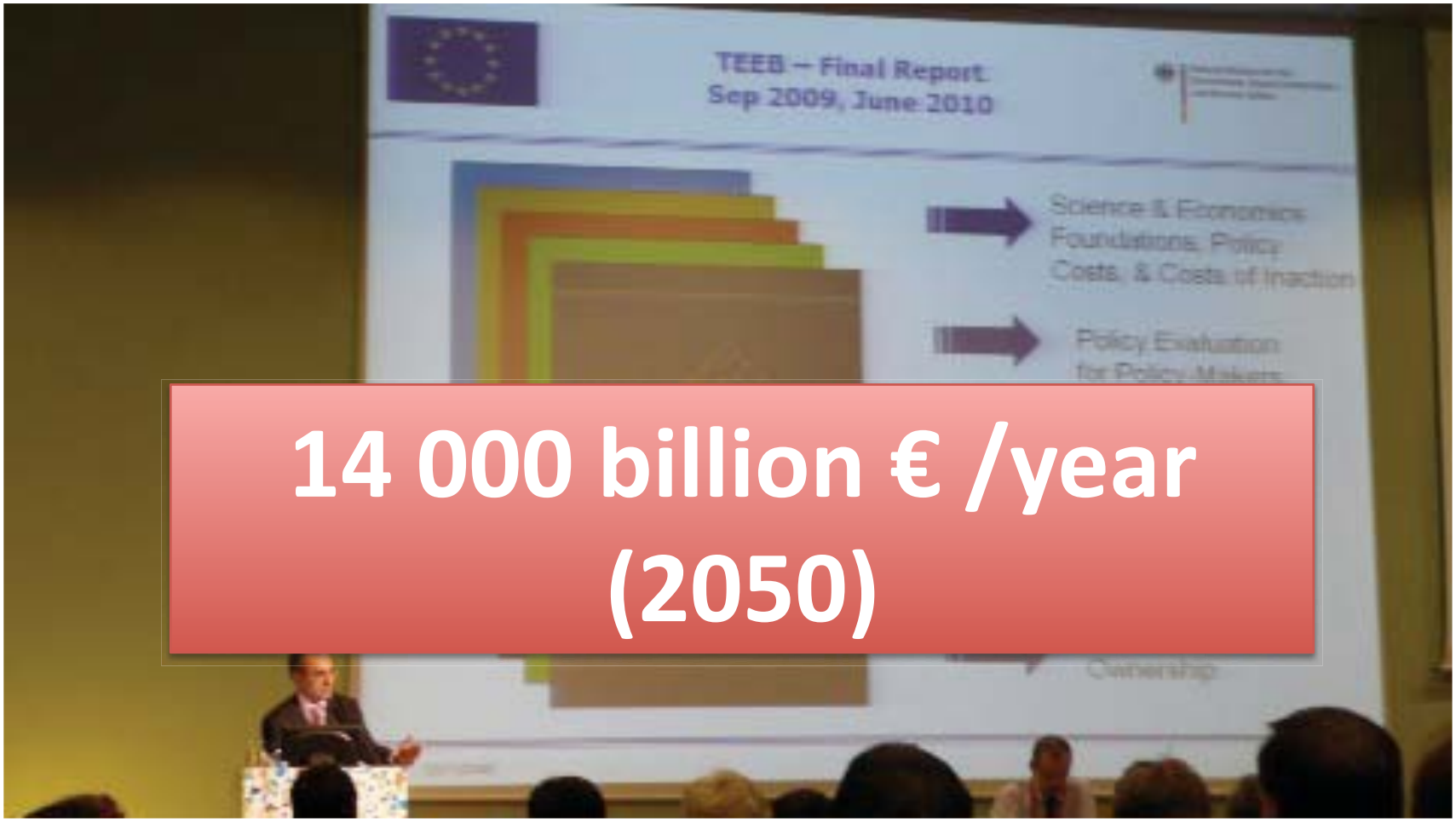
Soybean exportation



Landscape Change
Pampa Argentina


Valuing Biodiversity
MISSION: IMPOSSIBLE
MAY 22

The Economics of Ecosystems and Biodiversity (TEEB)
Cost Of Policy Inaction (COPI)



TEEB in the press

REUTERS

Print | Close this window

U.N. experts warn of economic cost of species loss

Raubbau kostet Menschheit Billionen

UN-Artenschützer: Waldverlust verschlingt jährlich sechs Prozent des Bruttosozialprodukts

Ecosystem destruction costing hundreds of billions a year

The Guardian, 30.05.2008

SPIEGEL ONLINE

29. Mai 2008, 17:47 Uhr

KOSTENRECHNUNG

Umweltzerst

Independent.co.uk

Loss of biodiversity threatens livelihoods of world's poorest

By Emily Dugan

Friday, 30 May 2008

This stock collapse is petty when compared to the nature crunch

The financial crisis at least affords us an opportunity to now rethink our catastrophic ecological trajectory

The Guardian, Tuesday October 14 2008 **George Monbiot**

May 30, 2008

Destroying the world's wildlife costs economy £40bn a year

Rodungen kosten Billionen

Nature loss 'dwarfs bank crisis'

By Richard Black

Environment correspondent, BBC News website, Barcelona

SEE ALS

Wildlife

09 Oct

The Economic Times India, 30.05.2008

Printed from THE ECONOMIC TIMES

Nature loss could halve living standards for the world's poor

30 May, 2008, 1303 hrs IST, ANI

LONDON: An environmental review, headed by an Indian, has concluded that damage to forests, rivers, marine life and other aspects of nature could halve living standards for the world's poor.

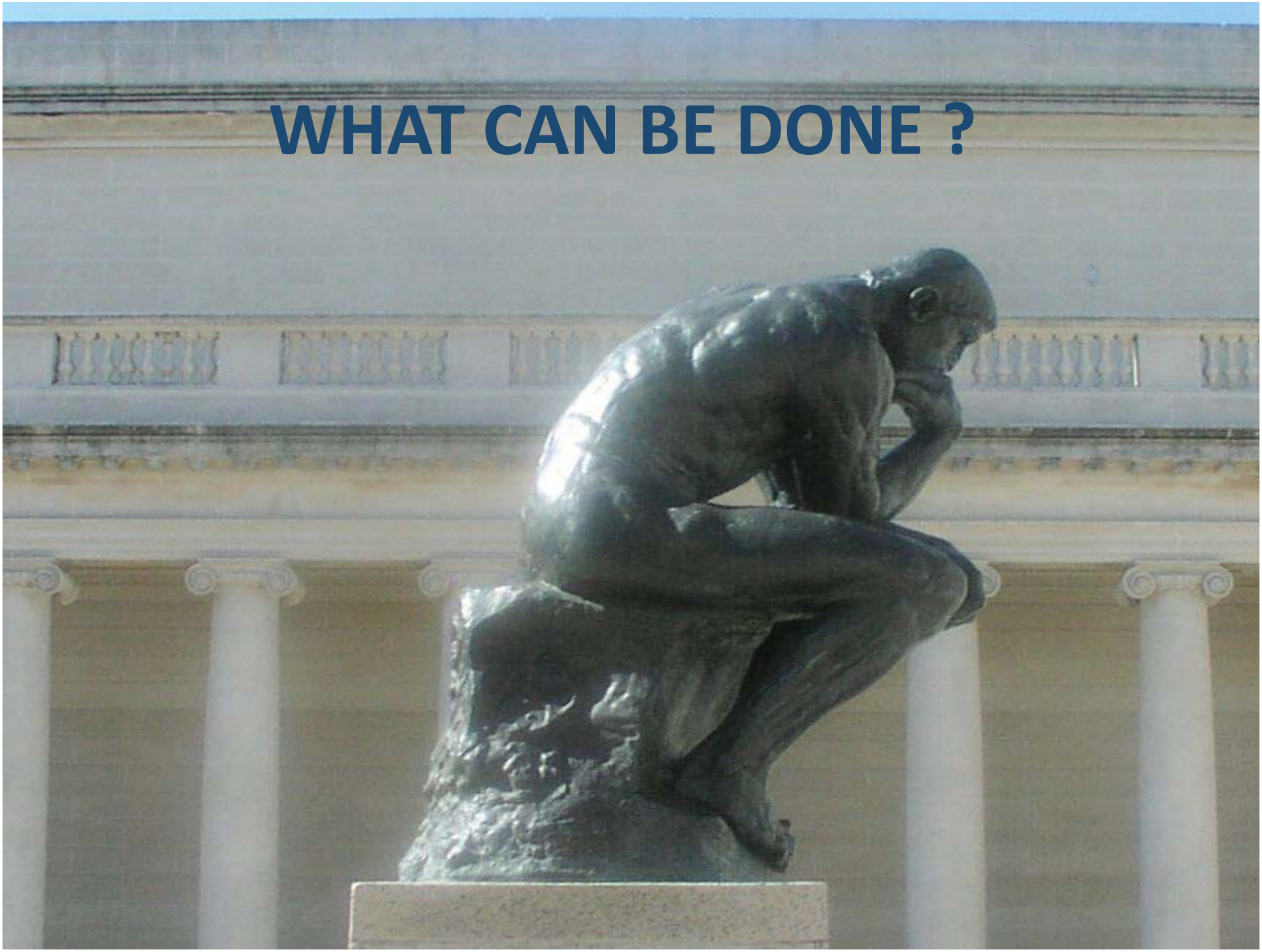
Umweltzerstörung bedroht Wohlstand

Deutsche-Bank-Manager warnt vor dramatischen Wachstumseinbußen von weltweit sechs Prozent bis zum Jahr 2050

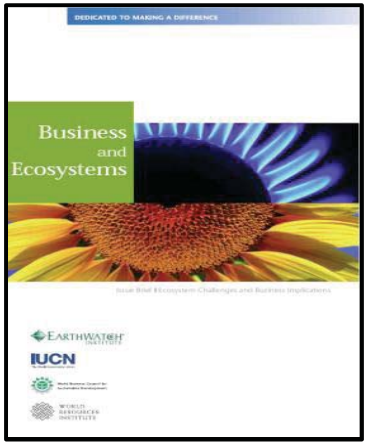
BONN. Der Schutz der Arten ist einer Untersuchung zufolge ökonomisch sinnvoller als die rücksichtslose Ausbeutung der Natur.

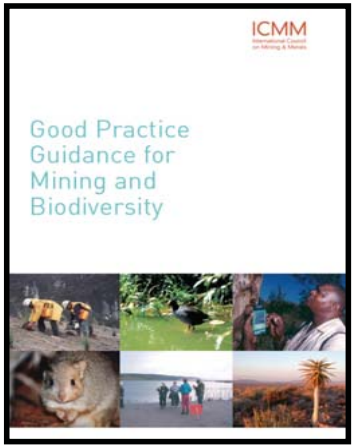
Collection: UFZ

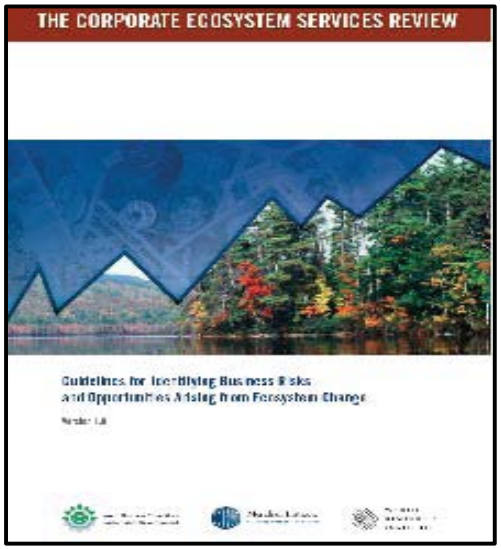
WHAT CAN BE DONE ?



Business & Biodiversity



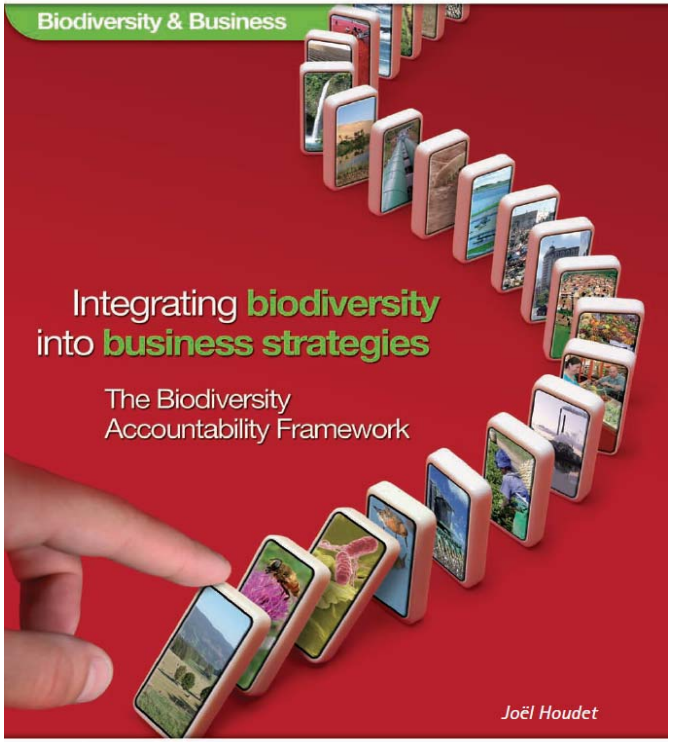




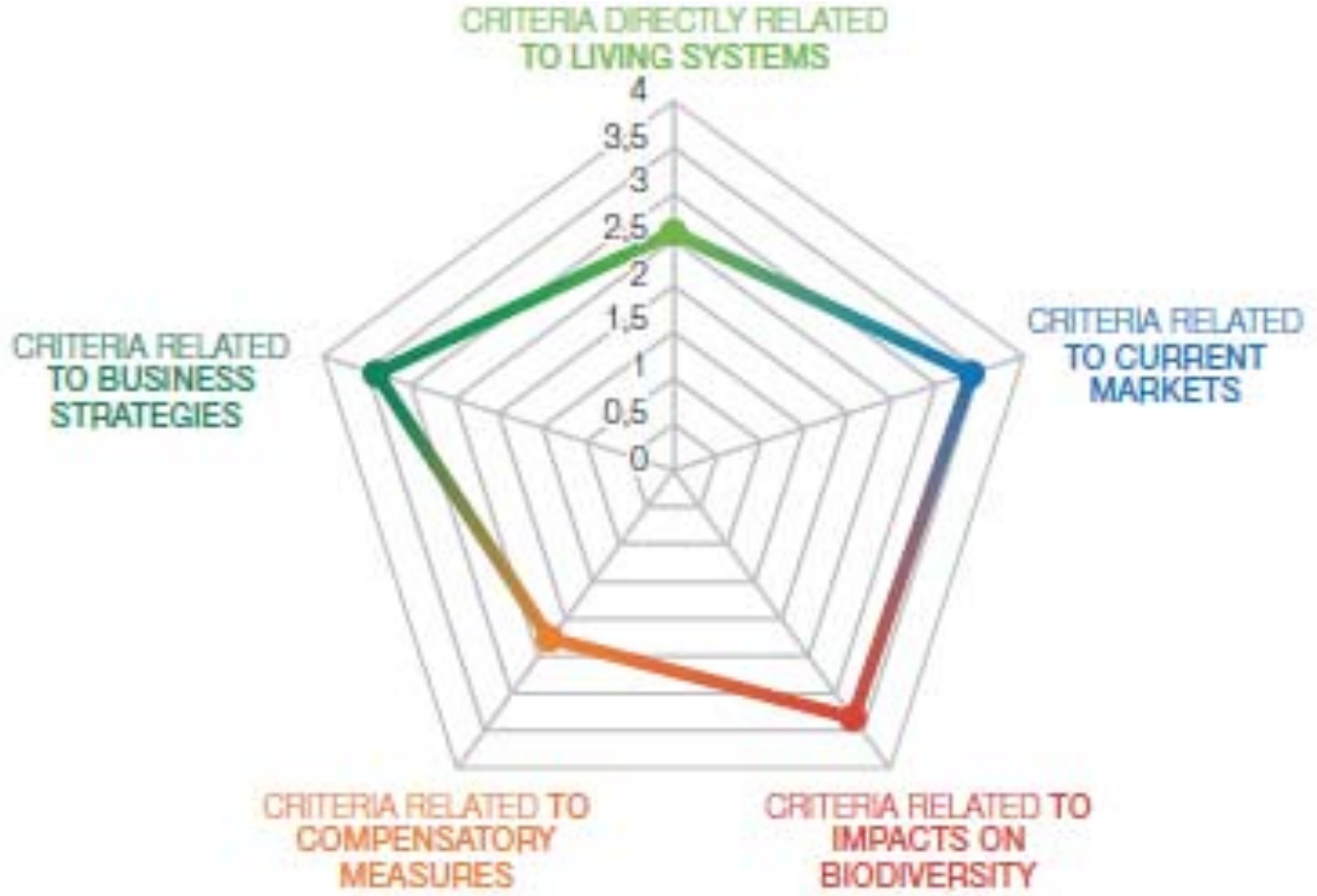
Vers le développement minier durable
Cadre stratégique

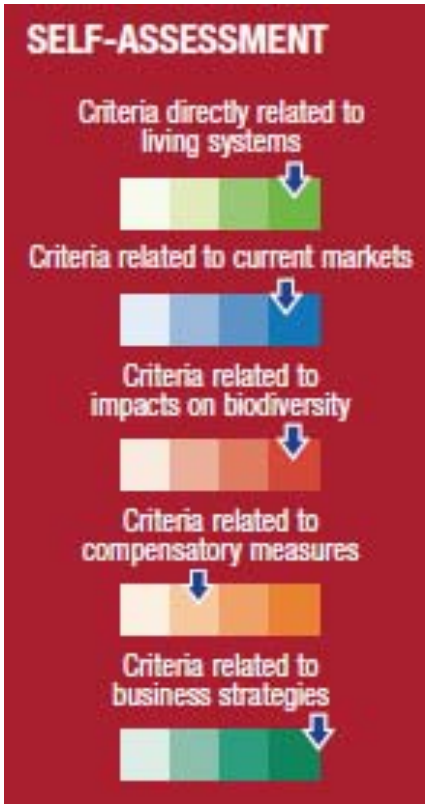
Les mines et la conservation de la biodiversité

La conservation de la biodiversité[1] est un engagement énoncé dans les Principes directeurs de l'initiative Vers le développement minier durable de l'AMC. Les membres de l'AMC reconnaissent que l'accès aux terres et le permis social de toute entreprise sont intimement liés aux pratiques responsables qu'elle adopte sur les plans social, environnemental et économique, et que l'analyse justifie en tout point que l'industrie appuie la conservation de la biodiversité. Les membres de l'AMC sont d'avis que l'activité minière, menée en consultation avec les communautés d'intérêts, peut coexister avec la conservation de la biodiversité. Les membres de l'AMC sont également d'avis que l'adhésion de l'entreprise aux principes de la conservation de la biodiversité est essentielle et, à ce titre, ils ont convenu des engagements suivants :

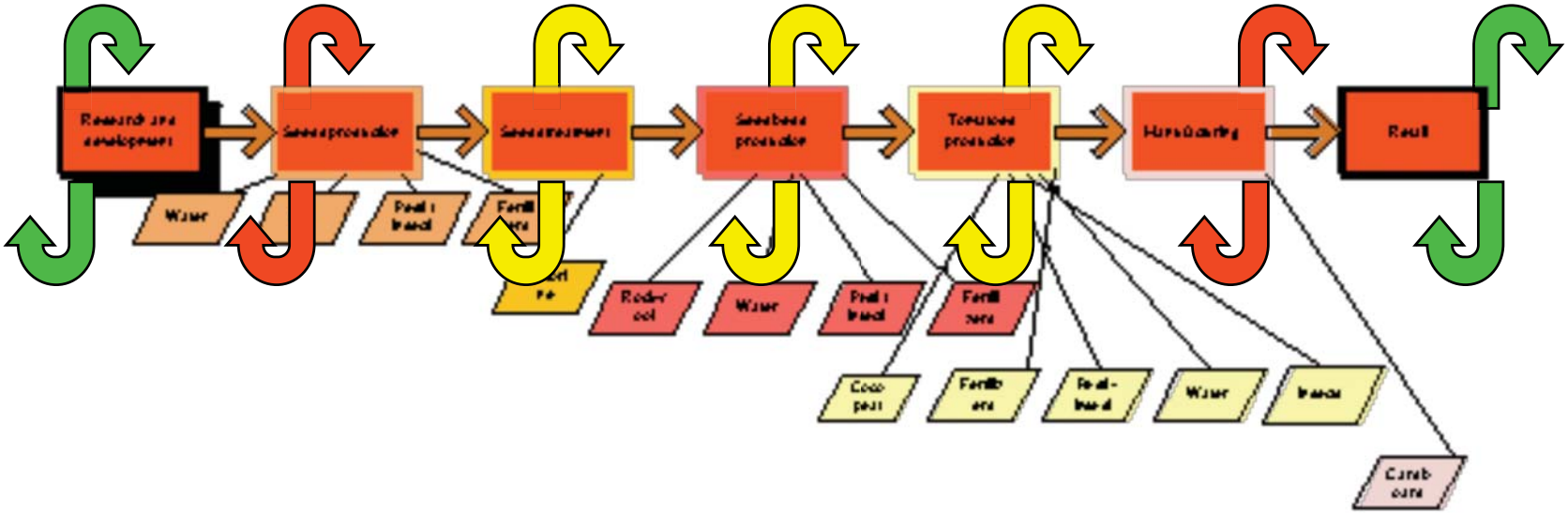


Assessing Business' dependence on living systems

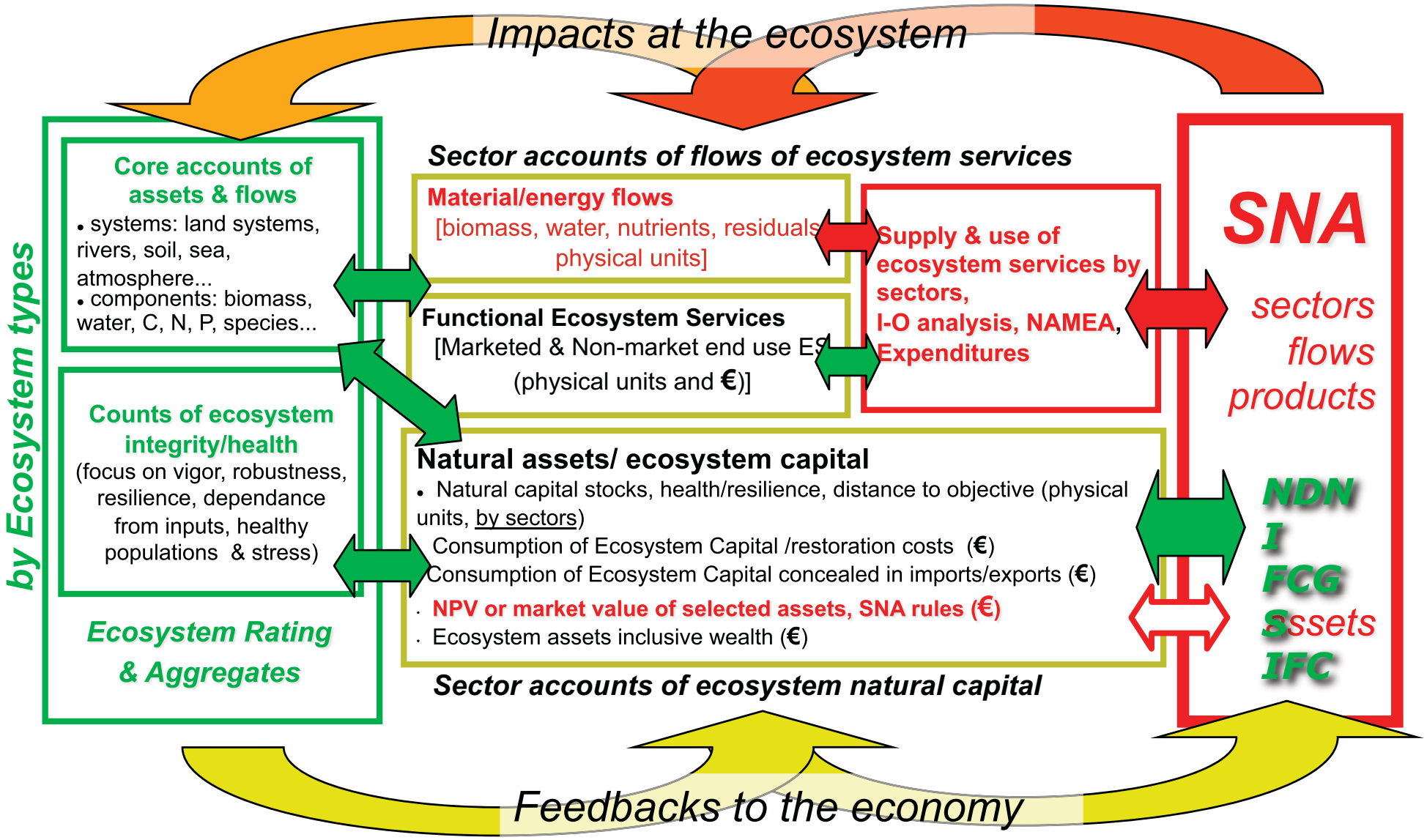




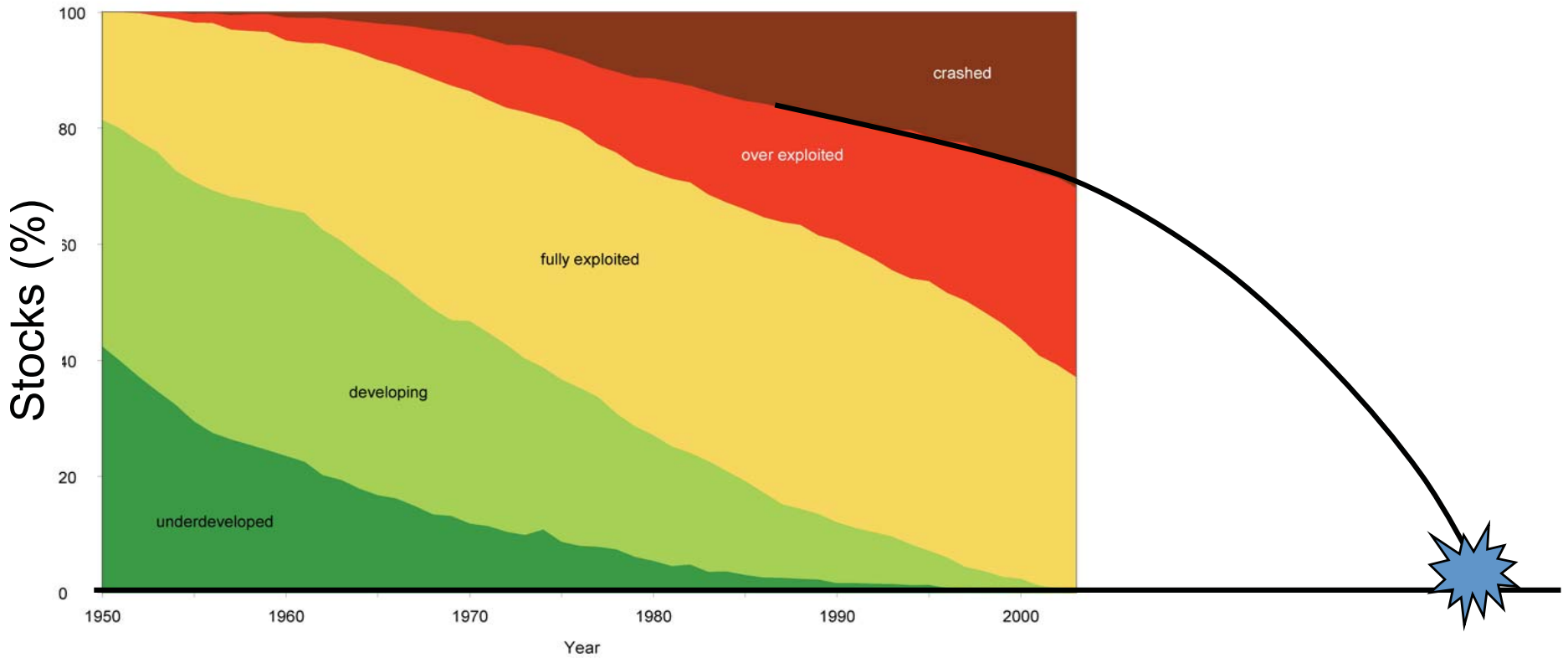
Biodiversity in Product Life Cycle



Ecosystem Accounts, SEEA2003 & SNA

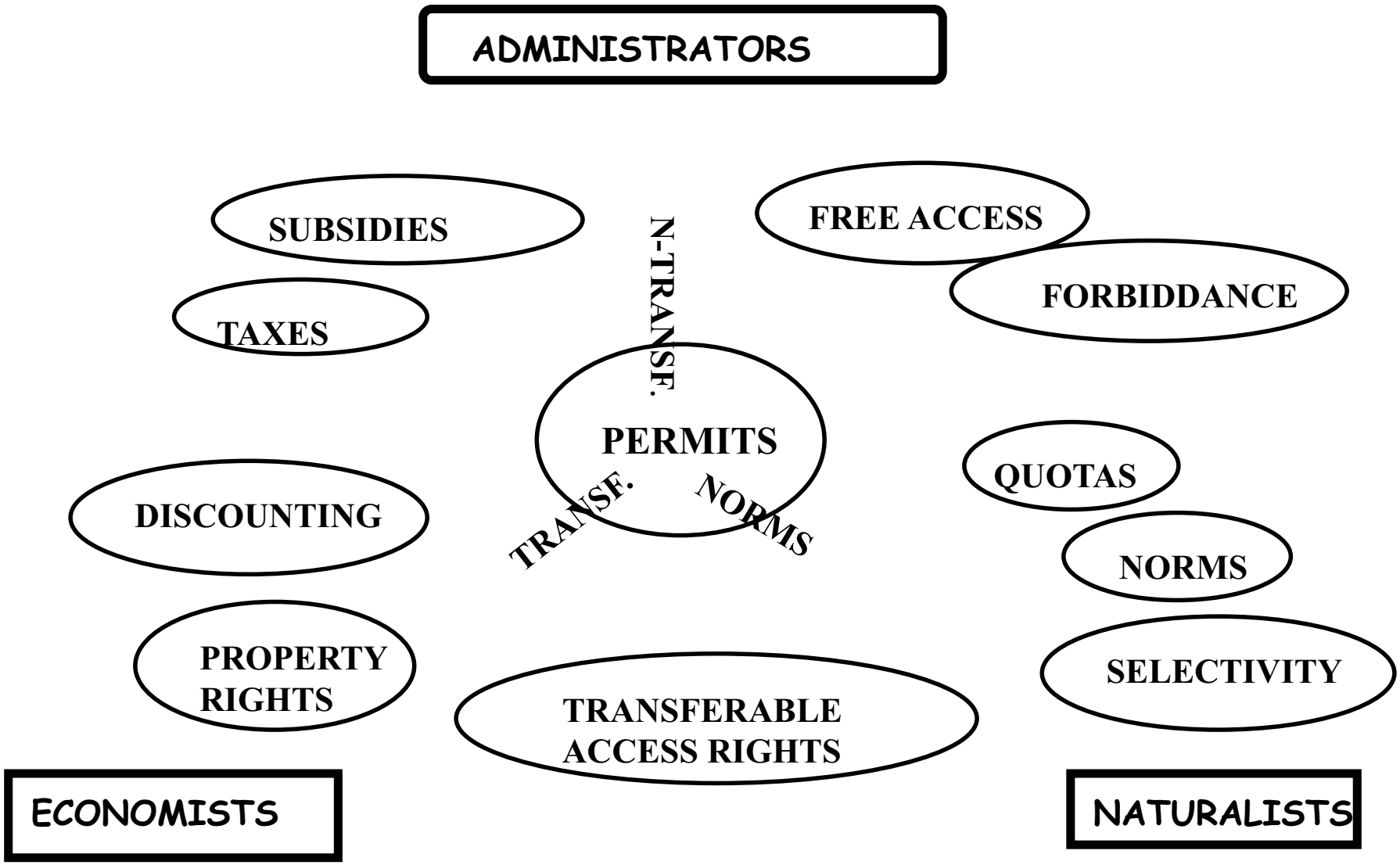


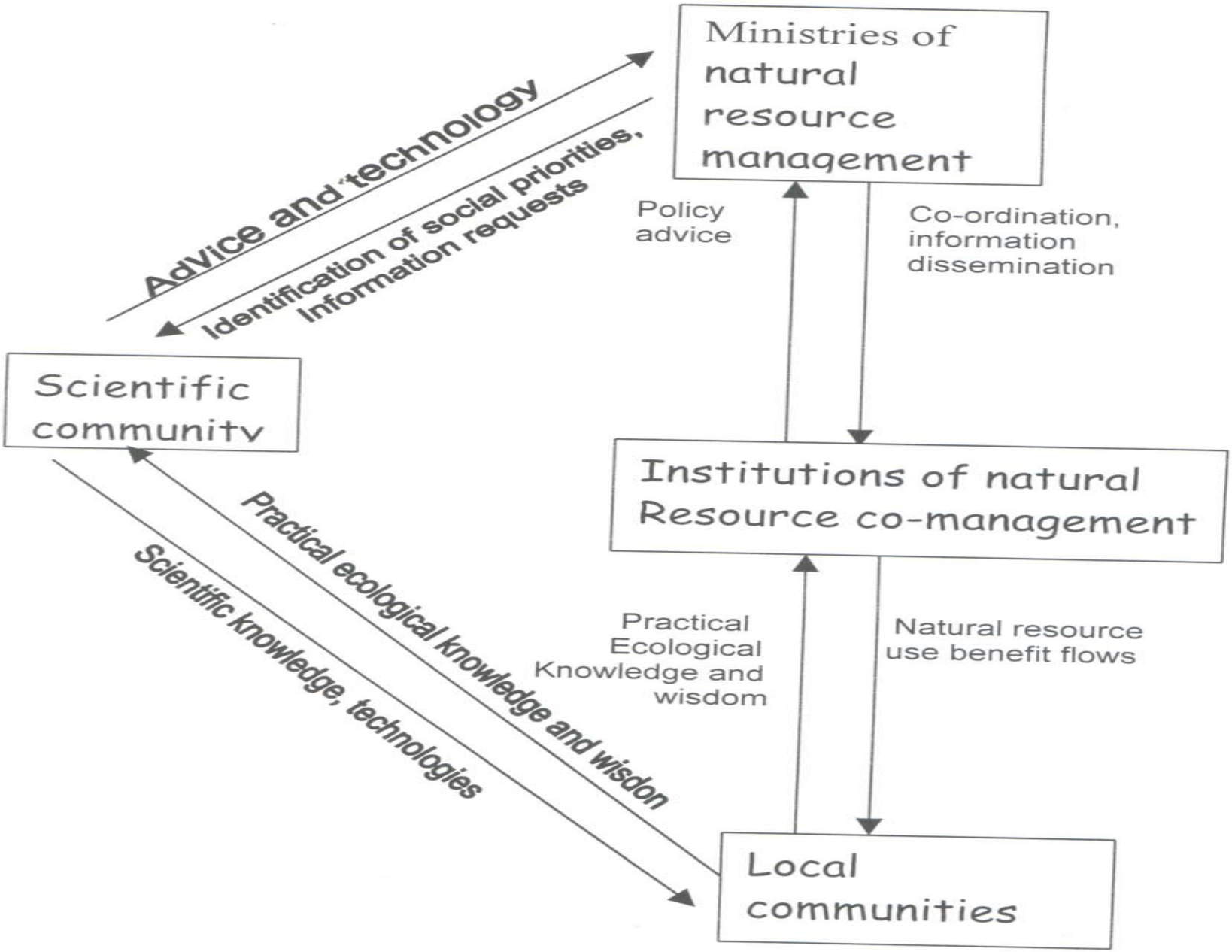
Fisheries' future



Worm et al. (*Nature)* 2006

Management Tools





Adaptive co-management


© IRD, C. Peignon

Pour une gestion durable de la pêche

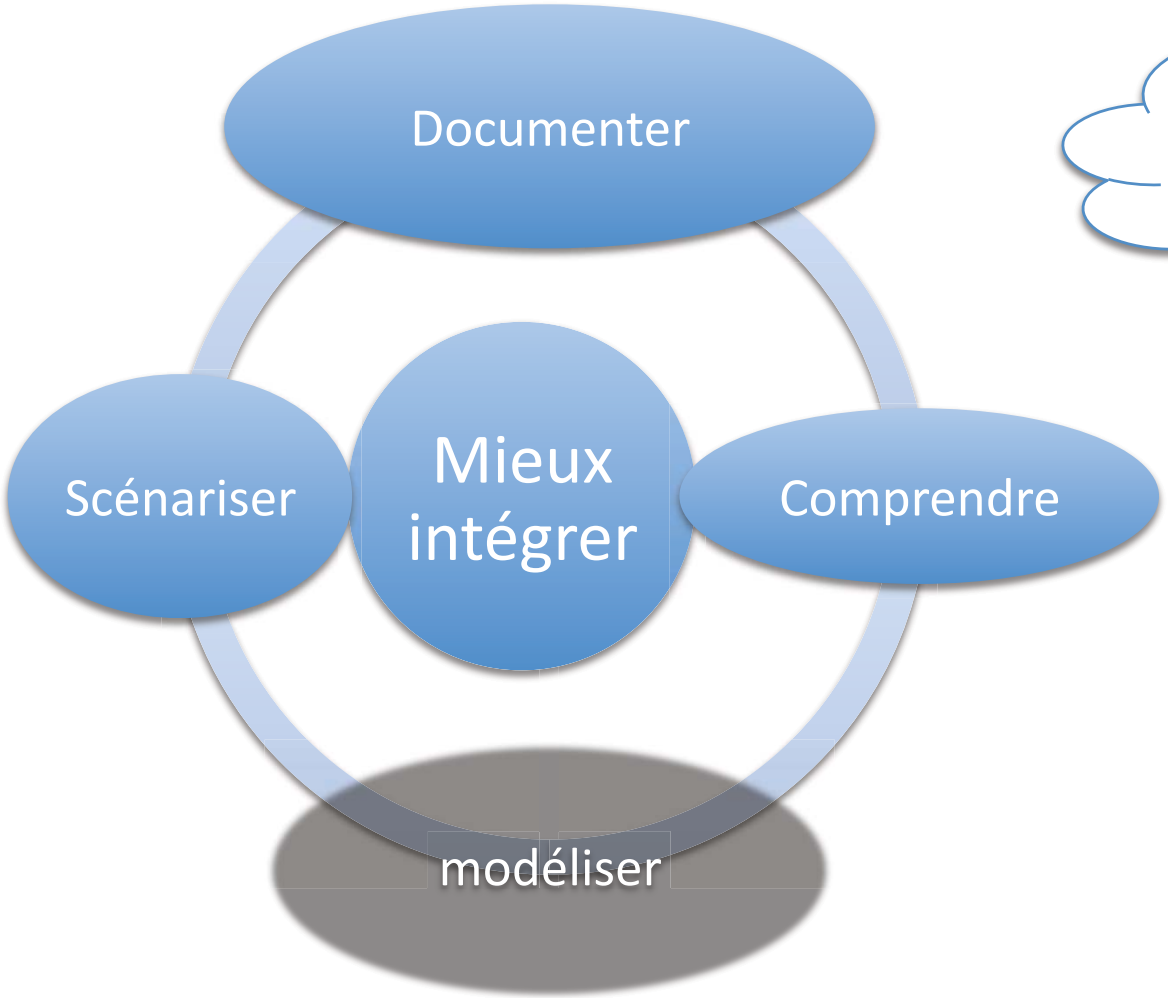
- **1. Rétablir le dialogue entre les pêcheurs, les scientifiques et les décideurs politiques**
- **2. Construire les outils de la décision politique pour une véritable Approche Ecosystémiques des pêches**
- **3. Faire des pêcheurs les premiers acteurs d'une pêche responsable**
- **4. Des pouvoirs publics qui exercent leurs prérogatives**
- **5. Des citoyens mieux informés et plus responsables**

*(*rapport du Sénat par P.M. Le Cléach 2009)

Biodiversité : quelle est la situation ?

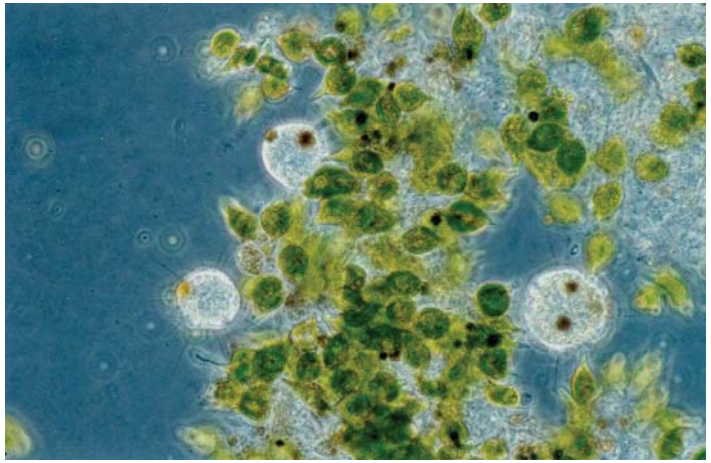
- Connaissance : la disparition de la biodiversité pose et posera de sérieuses menaces sur le bien-être de l'espèce humaine
- Opinion publique : la biodiversité est considérée comme une question secondaire
- Action : les efforts pour inverser les tendances à la perte de biodiversité restent trop faibles
- Gouvernance scientifique : la communauté scientifique reste éparpillée et faiblement impliquée dans les processus de décision
- Enjeux : Liens avec éradication de la pauvreté, sécurité alimentaire, approvisionnement en eau de qualité, croissance économique, conflits d'usage et d'appropriation, santé, énergie, climat

Orientations de la recherche française sur la biodiversité



FRB
FONDATION POUR LA RECHERCHE SUR LA BIODIVERSITÉ

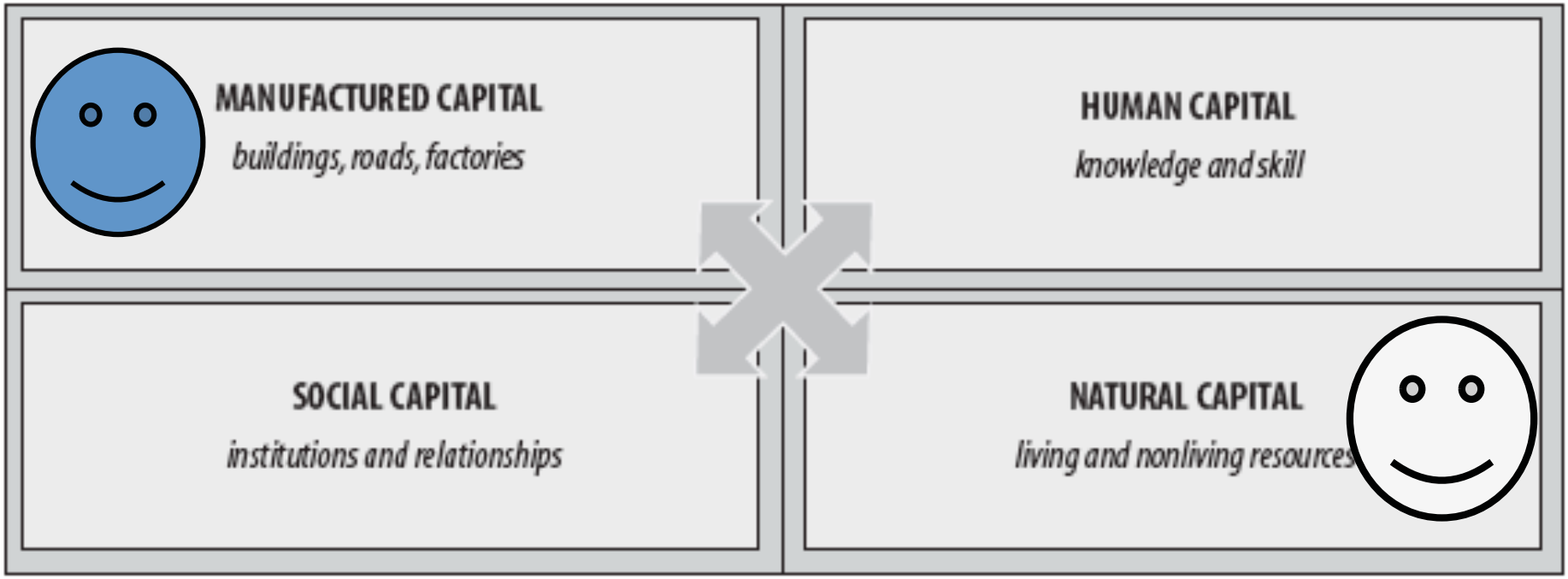
Biodiversity :
scientific and technological challenges



« la biodiversité : support potentiel d'une nouvelle économie, source de nouvelles technologies et objet d'une gouvernance à renouveler »

FRB
FONDATION POUR LA RECHERCHE SUR LA BIODIVERSITÉ

Long term: from manufactured to natural capital



(Millenium ecosystem Assessment)

Taxation of the consumption of nature

- From taxing labour and capital to taxing the consumption of nature;
- Energy: a Tax on Energy Added ?
- Renewable ressources: taxation of extraction
  - directly
  - or using tradable rights.

IMoSEB 2006-2007:
a worldwide consultation towards an International Mechanism of Scientific Expertise on Biodiversity

Supported by an International Steering Committee

> Scientists

Gaston Achoudong, Mary Kalin Arroyo, Carlo Heip, Leonard Hirsch, Yvon Le Maho, Michel Loreau, Keping Ma, Georgina Mace, Harold A. Mooney, Alfred Oteng-Yeboah, Charles Perrings, Peter Raven, José Sarukhan, Robert J. Scholes, Arkady Tishkov, Jacques Weber

> Representatives of governments

Algeria, Austria, Canada, China, Costa-Rica, Denmark, France, Gabon, Germany, India, Italy, Iran, Jamaica, Madagascar, Malawi, Malaysia, Marocco, Namibia, New-Zealand, Papua-New-Guinea, Poland, Saudi Arabia, Senegal, Slovenia, South Korea, Spain, Sweden, Switzerland, Thaïland, UK, USA

> Inter-Governmental or international Organizations, UN and Specialized Agencies, NGO's, Research initiatives and others

- > BIOVERSITY INTERNATIONAL
- > CI
- > CCITES
- > CMS
- > DIVERSITAS
- > EC–DG research
- > EEA
- > EPBRS
- > FAO
- > GBIF
- > GREENPEACE
- > ICES – CIEM
- > ICSU
- > IFB
- > IIFB
- > IUCN
- > MA
- > RAIPON
- > RAMSAR CONVENTION
- > SBF
- > SCB
- > SSCBD
- > SSCOBD
- > TNC
- > UNCBD
- > UNCCD
- > UNEP – DEWA
- > UNEP – WCMC
- > UNESCO
- > UNU – IAS
- > WORLD BANK
- > WWF

Led by an Executive Committee

> 15 members appointed by the ISC to implement ISC's recommendations for action

Co chairs: Prof. Michel Loreau (Canada) & Prof. Alfred Oteng-Yeboah (Ghana)

Members:

Ivar Baste, Martha Chouchena-Rojas, Christine Dawson, Horst Korn, Keping Ma, Georgina Mace, Marthe Mapangou, Charles Perrings, Peter Raven, José Sarukhan, Stephan Schnierer, Robert Watson, Jacques Weber

An original, open and inclusive exploratory process

North American Consultation

"Science-Policy interface is of critical importance. More science is better but translating information into action is more important"

European Consultation

"A flexible, light and hybrid model, based on existing structures ... exploring the potentiality of a network of networks"

Asian Consultation

"Be an Intergovernmental Panel with guiding principles: scientific credibility, political legitimicy and relevance"

South American Consultation

"All forms of knowledge should be taken into account. Need to strengthen the interface between technical/scientific expertise and decision making"

African Consultation

"A simple, decentralised, adaptable, flexible, non-bureaucratic structure, close to and accessible by the actors, capable of sharing knowledge and responding quickly"

Oceanian Consultation

"This mechanism should be civil society driven, and both reactive and pro-active. Representatives of local and indiginous communities and business sector should be included"

www.imoseb.net

Final recommandations

"Recommended to strengthen the science-policy interface in ways that respect a number of principles:

- *be scientifically independent, credible, inclusive,*
- *be policy legitimate through inter-governmental and multi-stakeholder involvement,*
- *be policy relevant without being policy prescriptive,*
- *be responsive to decision-makers needs,*
- *be communicated in an appropriate form for consideration and possible action,*
- *be based on a robust and relevant conceptual framework,*
- *address decision-makers from governments and other sectors of society at global, regional and national scales,*
- *be supported by networking efforts of scientific and knowledge holders,*
- *promote dialogue between international agencies and decision-makers"*

ipBes

The Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services

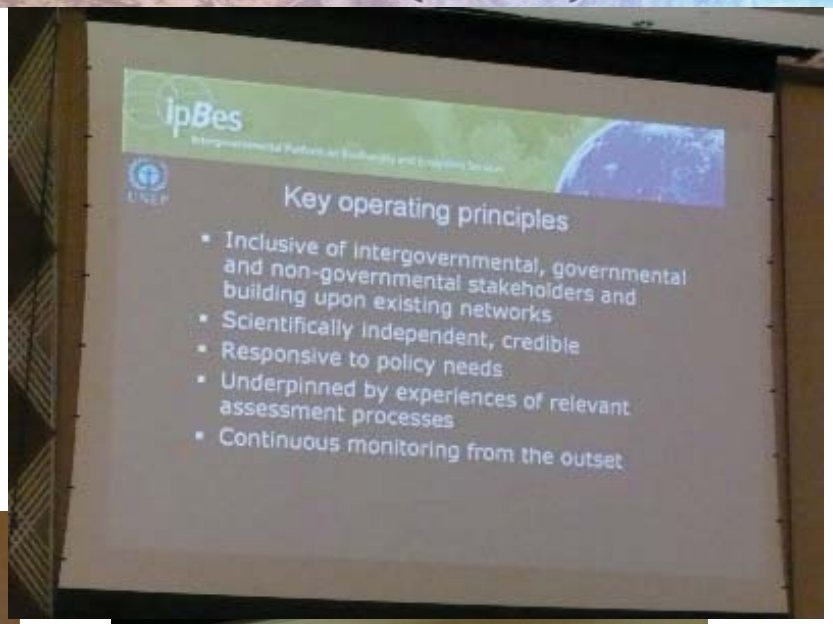
If not now, when?
If not us, who?
If not together, how?

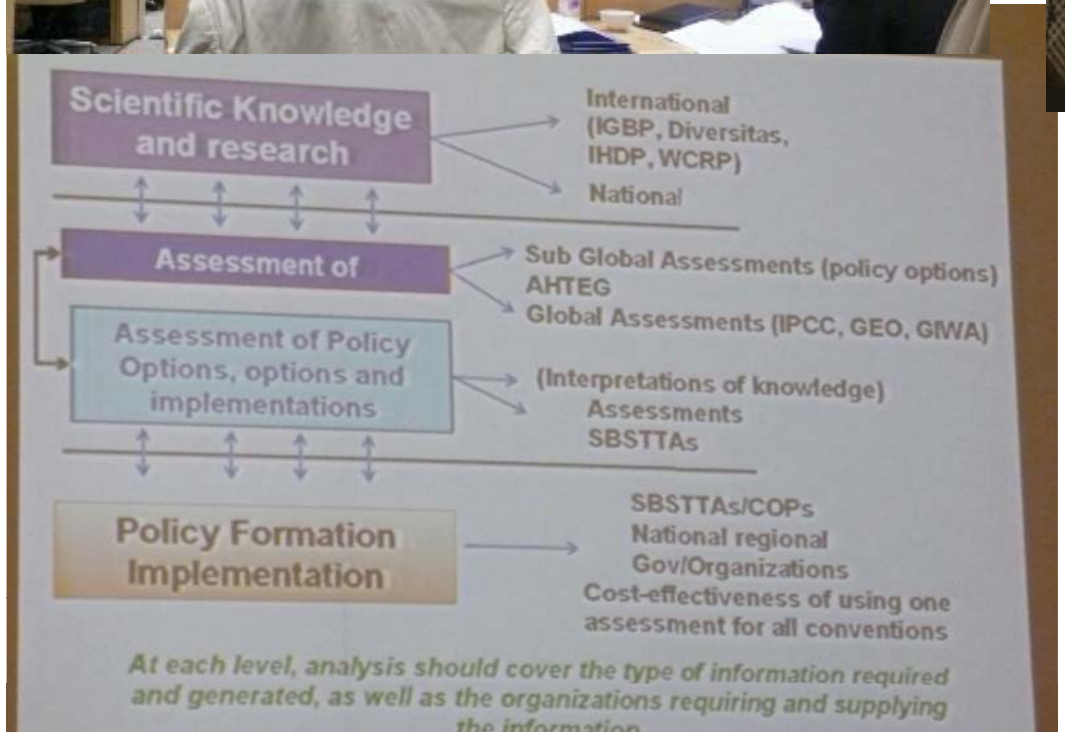
www.ipbes.net

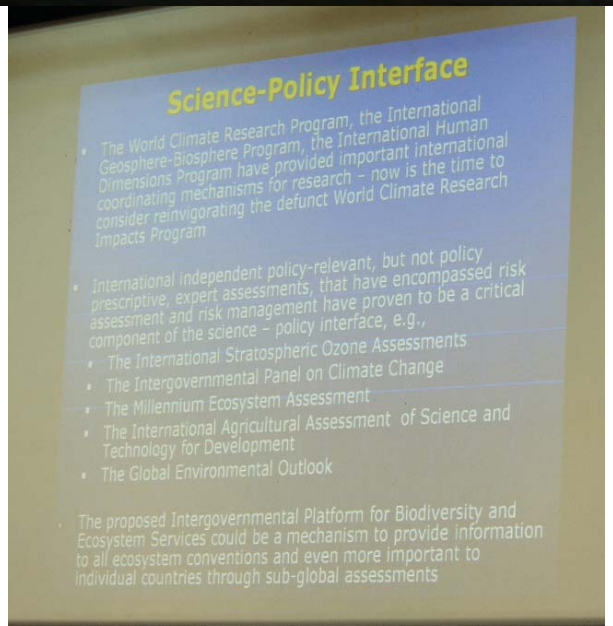
AD HOC INTERGOVERNMENTAL AND MULTI-STAKEHOLDER MEETING ON AN INTERGOVERNMENTAL SCIENCE-POLICY PLATFORM ON BIODIVERSITY AND ECOSYSTEM SERVICES

10th - 12th November 2008

Putrajaya International Convention Centre (PICC)







Next steps

- Nairobi (Feb 2009) : 25th Gov Council UNEP
- Paris meeting (April 2009) : MeA meeting
- Brussels (May 2009) : EU IpBES
- Nairobi (Oct 2009) : 2nd Intergov meeting
- …

- Aichi-Nagoya (Oct 2010) : CoP 10 and UN International Year of Biodiversity

vielen Dank !

- Thanks to :

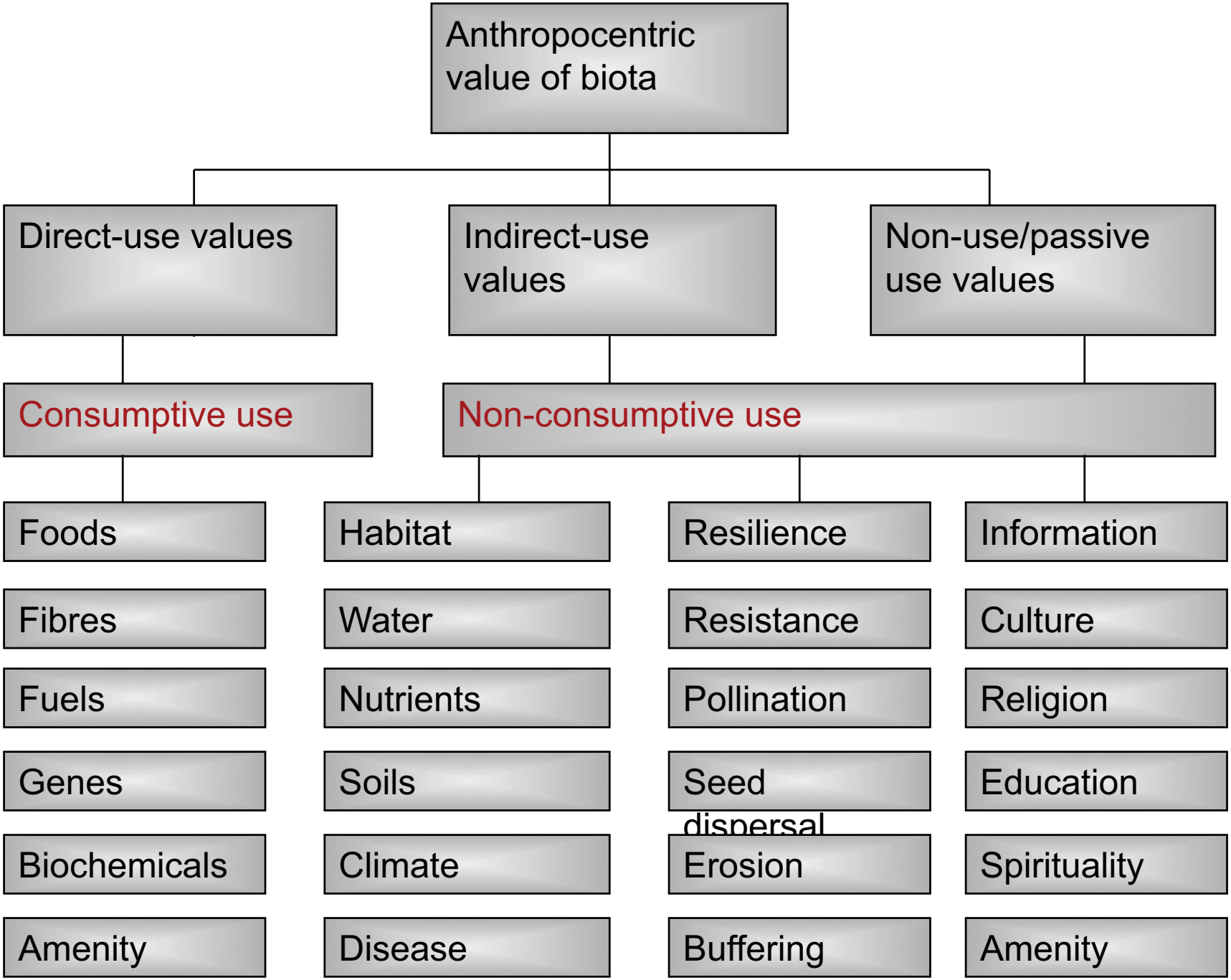
  J. Weber, B. David, J.L. Weber, B. Chevassus, P. Cury, M. Thibon, C. Neßhöver, H. Leriche, J.P. Reveret, J.M. Salles, C. Körner, A. Dobson, M. Gadgil, M. Loreau, M. Donoghue, N. Myers, C. Samper, C. Perrings, Millennium ecosystem Assessment, Wikipedia

Contact : didier.babin@cirad.fr


Bilicki
RESEARCH CONCLUDES:
WE ARE DESTROYING EARTH.
COULD YOU KINDLY REPHRASE THAT IN EQUIVOCAL, INACCURATE, VAGUE, SELF-SERVING AND ROUNDABOUT TERMS THAT WE CAN ALL UNDERSTAND?
GOVERNMENT

Enjeux et questionnements

- Economiques et sociaux
- De durabilité et de synergie
- De décision et de contrôle
- Politiques de souveraineté, de coopération et de gouvernance internationale
- De représentation et d'évaluation
- De recherche-développement : innovation technologique
- De démocratie et d'innovation sociale
- De recherche …


Anthropocentric value of biota
Direct-use values
Indirect-use values
Non-use/passive use values
Consumptive use
Non-consumptive use
Foods
Fibres
Fuels
Genes
Biochemicals
Amenity
Habitat
Water
Nutrients
Soils
Climate
Disease
Resilience
Resistance
Pollination
Seed dispersal
Erosion
Buffering
Information
Culture
Religion
Education
Spirituality
Amenity

4. Changes in Economic value due to loss of Biodiversity

Land based ecosystems only
Excl. Polar & Desert Biome

2050 annual loss relative to 2000 In Billions of Euros

	Total	Food, fiber, fuel	Air quality maintenance	Soil quality maintenance	Climate regulation (i.e. carbon storage)	Water regulation, water purification and waste management	Cultural diversity, identity, heritage, Recreation & ecotourism
World Total (Land-based ecosystems*)	**-13938**	**192**	**-2019**	**-1856**	**-9093**	**-782**	**-303**
Natural areas	**-15078**	**-383**	**-2026**	**-1779**	**-10280**	**-748**	**-293**
Forest managed	**1852**	**184**	**208**	**166**	**1188**	**70**	**31**
Extensive Agriculture	**-1109**	**-256**	**-56**	**-50**	**-712**	**-23**	**-8**
Intensive Agriculture	**1303**	**746**	**38**	**41**	**448**	**21**	**6**
Woody biofuels	**381**	**29**	**33**	**30**	**270**	**15**	**2**
Cultivated grazing	**-786**	**-128**	**-217**	**-264**	**-6**	**-116**	**-41**

➔ **This loss is equivalent to 7% of projected global GDP for 2050.** .

➔ **The loss grows with each year of biodiversity loss**